

PROJECT MANUAL

Contract Documents
Specifications

FOR

**Betty's Lane Drainage Improvements
ITB# 200623**

September 2006



Dept. of Public Services, Engineering Divisions

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INVITATION TO BID

Betty's Lane Drainage Improvements

ITB # 200623

The City of Winchester will receive bids for furnishing of all labor, equipment and materials necessary for the following project:

Betty's Lane Drainage Improvements

Work includes 525 LF of drainage pipe and associated drainage structure installation, 152 LF of grassed drainage swale, associated water main relocation, maintenance of traffic and associated construction items.

A non-mandatory pre-bid meeting will be held on **Friday, September 22, 2006, at 10 AM** in the 4th floor exhibit hall of Rouss City Hall, 15 N. Cameron Street, Winchester, VA 22601.

Contract Drawings and Specifications may be obtained from the office of:

City of Winchester, Virginia
Finance Department
Purchasing Division
Rouss City Hall, 1st Floor
15 North Cameron Street
Winchester, Virginia 22601
Telephone (540) 667-1815, EXT. 1477

Or from the City's website at:

<http://www.winchesterva.gov/purchasing/itbrfp.php>

Bids shall be made on the blank forms provided with the Specifications and shall be delivered to the above address on or before **2 PM, Friday October 6, 2006** at which time they will be publicly opened and read aloud.

Bids will be received only from contractors who are registered in the Commonwealth of Virginia. **Bidders shall indicate on the outside of the envelope containing bids, and on the Bid Form, their current Virginia Contractors Registration Number.**

Each proposal shall be accompanied by a satisfactory Bid Guarantee in the amount of 5% of the bid, in the form of a certified or cashier's check drawn on a bank chartered under the laws of the Commonwealth of Virginia; payable to the Treasurer of the City of Winchester, or a Bid Bond, as a guarantee that the bidder will within fifteen (15) days after the date of the award of the Contract, execute an agreement and file insurance as

required by the Contract Documents if his proposal is accepted. If the successful bidder fails to execute and file the agreement and insurance, the amount of the Bid Guarantee shall be forfeited.

Each proposal submitted shall also include a signed copy of the Non-collusion Affidavit that is a part of the Contract Documents.

Performance and Payment Bonds will be required of the successful bidder, each in an amount equal to one hundred (100) percent of the amount of the Contract, conditioned upon the faithful performance of the Contract and to the payment in full to all persons furnishing labor, materials, equipment, etc., for and in connection with the work to be performed under the contract.

Bidder desiring to withdraw his bid after the bid opening procedure, shall give notice in writing of his claim of right to withdraw his bid within two (2) business days after the conclusion of the bid opening procedure. Bidder shall submit to the City his original work papers; documents and materials used in preparation of the bid sought to be withdrawn.

The City of Winchester reserves the right to reject any proposal for failure to comply with all requirements of this notice or any of the Contract Documents; however, it may waive any minor defects or informalities at its discretion. The City further reserves the right to reject any and all proposals or to award a contract that in its judgement is in the best interest of the City.

The undersigned Purchasing Agent, pursuant to Chapter 21, Section 21-12 and Section 21-13 of the Winchester City Code, as amended, hereby delegates to the Utilities Department of the City of Winchester to provide information and clarification to prospective bidders, to receive and evaluate bids and to prepare a recommendation to the City Manager for contract award.

CITY OF WINCHESTER, VIRGINIA

BY: Steve Corbit
Purchasing Agent

**Betty's Lane Drainage Improvements
ITB # 200623**

INSTRUCTIONS TO BIDDERS

1. OWNER AND ENGINEER:

The Owner is the City of Winchester, Virginia, which shall be represented by the City Engineer who shall also perform the duties of the Engineer. Telephone: Department of Public Services, (540) 667-1815, extension 1476.

2. COPIES OF CONTRACT DOCUMENTS:

2.01 Complete sets of Bidding Documents may be obtained at the following location:

City of Winchester, Virginia
Finance Department
Purchasing Division
Rouss City Hall, 1st Floor
15 North Cameron Street
Winchester, Virginia 22601
Telephone: (540) 667-1815, EXT. 1477

2.02 Complete set of Bidding Documents shall be used in preparing bids; neither the Owner nor the Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining bids on the Work and do not confer a license or grant for any other use.

3. EXAMINATION OF CONTRACT DOCUMENTS AND SITE:

3.01 Before submitting a bid, each bidder must examine the Contract Documents thoroughly, visit the site to familiarize himself with local conditions that may in any manner affect cost, progress, or performance of the work, familiarize himself with federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress, or performance of the work; and study and carefully correlate bidder's observations with the Contract Documents.

3.02 A non-mandatory pre-bid meeting will be held on Friday, September 22, 2006, at 10AM in the 4th Floor Exhibit Hall of Rouss City Hall, 15 N. Cameron Street, Winchester, VA 22601.

3.03 Before submitting his bid, each bidder will, at his own expense, make such additional investigations and tests as the bidder may deem necessary to determine his bid for performance of the work in accordance with time and other terms and conditions of the

Contract Documents. The Contractor shall be responsible for taking his own borings or making any investigations he requires to establish subsurface conditions in the area of this Contract. The City does not assume any responsibility for the subsurface conditions which may be encountered. On request, Owner will provide each bidder access to the site to conduct such investigations.

- 3.04 The submission of a bid will constitute an incontrovertible representation by the bidder that he has examined the site and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions of the Work.
- 3.05 It is understood and agreed by the bidder that the estimate of quantities (if provided) are approximate, and are presented in order to obtain unit prices and approximate amount of the Contract. The Contractor shall make no claim against the City because of any estimate, tests or representations made by any officer or agent of the City, which may prove to be in any respect erroneous.
- 3.06 Scope of the work is as specified herein. The Owner, however, reserves the right to make adjustments to the scope of the work. Such adjustments shall be accomplished by appropriate Change Orders.

4. **INTERPRETATIONS:**

All questions about the discrepancies or ambiguities in the Contract Documents shall be submitted to Engineer in writing. Replies will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than five (5) calendar days prior to the date for opening of bids may not be answered. Only questions answered by formal written Addenda will be binding.

5. **BID GUARANTEE:**

- 5.01 Bid Guarantee shall be made payable to Owner, in an amount of five percent (5%) of the bidder's maximum bid price and in a form of a certified or cashier's check drawn on a bank chartered under the laws of the Commonwealth of Virginia; payable to the Treasurer, City of Winchester, or a Bid Bond issued by a surety having registered resident agents in Virginia.
- 5.02 The Bid Guarantee of the successful bidder will be retained until such bidder has executed the Agreement and furnished the required Contract Security, whereupon it will be returned. If the successful bidder fails to execute the agreement and furnish the required Contract Security within fifteen (15) calendar days of the Notice of Award, Owner may annul Notice of Award and the Bid Guarantee of the bidder will be forfeited.

6. **REQUIRED BONDS:**

Performance and Payment Bonds will be required of the Successful bidder, each in an amount equal to one hundred percent (100%) of the amount of the Contract, conditioned upon the faithful performance of the Contract and to the payment in full to all persons furnishing labor, materials, equipment, etc., for and in connection with the work to be performed under the Contract.

7. **CONTRACT TIME:**

Contractor agrees that all bid work will be completed within **ninety (90) calendar days** from the date specified to begin work as set forth in a written notice to proceed. Owner and Contractor recognize that the time is of essence in this Contract, and if the work is not completed within the specified time, plus any extensions allowed, then the Contractor shall pay, as liquidated damages, \$500.00 for each calendar day that expires after the specified completion date.

8. **PAYMENT PROCEDURE:**

8.01 The basis for payment shall be the actual percentage of work completed, as determined in the field by the Engineer.

8.02 An amount equal to five percent (5%) of each progress payment shall be held from each payment as retainage.

9. **SUBCONTRACTORS:**

9.01 The apparent successful bidder and any other bidder so requested, will within seven (7) days after the day of bid opening submit to Owner a list of all subcontractors and other persons and organizations, including those who are to furnish the principal items of material and equipment, proposed for the work. Such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of qualification for each such subcontractor, person, and organization. If Owner or Engineer, after due investigation has reasonable objection to any proposed subcontractor, other person or organization, either may before giving the Notice of Award request the apparent successful bidder to submit an acceptable substitute without an increase in Bid price. If the apparent successful bidder declines to make any such substitution, the Contract shall not be awarded to such bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Bond. Any subcontractor, other person, or organization so listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer.

9.02 No Contractor shall be required to employ any subcontractor, other person, or organization against whom he has reasonable objection.

10. **SUBSTITUTE MATERIAL AND EQUIPMENT**

- 11.01 Whenever it is indicated in the Contract Documents that a substitute or "or equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered until after the Effective Date of the Contract Agreement. The procedure for submittal of any such application by Contractor and consideration by Engineer is set forth in the General Conditions.

11. **PREPARATION OF BID:**

- 11.01 The Bid Form is included in these Specifications, and may not be altered in any way. Additional copies may be obtained from the Engineer.
- 11.02 Bid Forms must be completed in ink or by typewriter. The Bid price must be stated in words and numerals; in case of conflict, words will take precedence.
- 11.03 A bidder shall execute his Bid as stated below:
- A. A Bid by an individual shall show his name and official address.
 - B. A Bid by a partnership must be executed in the partnership name and signed by a partner. His title must appear under his signature and the official address of the partnership shall be shown.
 - C. A Bid by a corporation must be executed in the corporate name by an officer of the corporation and must be accompanied by a certified copy of the resolution of the board of directors authorizing the person signing the Bid to do so on behalf on the corporation. The corporate seal shall be affixed and attested by the secretary. The state of incorporation and the official corporate address shall be shown.
 - D. All names must be printed below the signature.
 - E. Contractor's license or registration number shall be entered in the space provided on the Bid Form.
- 11.04 Bidder shall make acknowledgement on the Bid Form of receipt of all Addenda, the numbers of which shall be filled in the Bid Form.

12. **SUBMISSION OF BIDS:**

- 12.01 Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be included in an opaque sealed envelope, along with the Bid Bond and other required Documents. The sealed envelope shall indicate the Project Title, name and address of the bidder, and State Registration No. of the bidder. If the bid is sent through the mail, or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "**BID ENCLOSED**" on the face thereof.
- 12.02 Timely delivery of the Bid shall be the sole responsibility of the Bidder. Bids must be

received not later than the time and date stated in the Invitation to Bid. Bids by telephone, facsimile or other forms shall not be accepted.

13. **MODIFICATION AND WITHDRAWAL OF BIDS:**

- 13.01 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted at any time prior to opening of the bids. The request for withdrawal or modification must be in writing and signed by a person duly authorized to do so.
- 13.02 No bidder may withdraw his bid within sixty (60) calendar days after the actual date of the bid opening, except as allowed by the Code of the City of Winchester, Virginia, Section 21-43, which states "the Bidder shall give notice in writing of his claim within two (2) business days after the conclusion of the bid opening procedure". Bidder shall submit to the Owner his original work papers, documents and materials used in preparation of his bid sought to be withdrawn.

14. **OPENING OF BIDS:**

- 14.01 Bids shall be opened publicly, and will be read aloud at the time and location indicated on the Invitation to Bid. An abstract of the amounts of the Bids shall be made available after the opening of bids.
- 14.02 All bids shall remain open for sixty (60) days after the day of the bid opening, but Owner may, in his sole discretion, release any bid and return the Bid Bond prior to that date.

15. **AWARD OF CONTRACT:**

- 15.01 Owner reserves the right to reject any and all bids, to waive any and all informalities and to negotiate Contract terms with the successful bidder, and the right to disregard all nonconforming, nonresponsive, or conditional bids. Discrepancies between words and figures shall be resolved in favor of words. Discrepancies between indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- 15.02 In evaluating bids, Owner will consider the qualifications of the bidders, whether or not the bids comply with the prescribed requirements, and alternates and unit prices if requested in the Bid Form. Owner may consider the qualifications and experience of subcontractors and other persons and organizations proposed for the work.
- 15.03 Owner may conduct such investigations as he deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications, and financial ability of the bidders, proposed subcontractors and other persons and organizations, to do the work in accordance with the Contract Documents and to the Owner's satisfaction within the prescribed time.

- 15.04 Owner reserves the right to reject the bid of any bidder who does not pass any such evaluations to Owner's satisfaction.
- 15.05 If the Contract is to be awarded, it will be awarded to the lowest bidder whose evaluation by Owner indicates to Owner that the award will be in the best interest of the Project. Owner reserves the right to award the Contract to the bidder submitting the lowest base bid or the lowest combination of base and alternate bid.
- 15.06 If the Contract is to be awarded, Owner will give the successful bidder a Notice of Award within sixty (60) days after the day of the bid opening.

16. **SIGNING OF CONTRACT:**

When Owner gives Notice of Award to the successful bidder, it will be accompanied by at least three (3) unsigned counterparts of the Contract and all other Contract Documents. Within fifteen (15) days thereafter, Contractor shall sign and deliver at least three (3) counterparts of the Contract to the Owner with all other Contract Documents attached. Within ten (10) days thereafter, Owner will deliver all fully signed counterparts to Contractor. Engineer will identify those portions of the Contract Documents not fully signed by Owner and Contractor and such identification shall be binding on all parties.

17. **EQUAL OPPORTUNITY REQUIREMENTS:**

During performance of the Contract, the Contractor agrees not to discriminate against any employees or applicant for employment because of race, color, religion, sex, national origin, age, or disability. Contractor shall take affirmative action to ensure that the applicants are employed, and that the employees are treated during employment, without regard to their race, color, religion, sex, national origin, age, or disability. Such action shall include, but not be limited to the following:

employment, upgrading, demotion, transfer, recruitment, recruitment advertising, layoff, termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Contractor agrees, as a condition to this Contract, to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

***** END OF SECTION *****

BID FORM
Betty's Lane Drainage Improvements
ITB# 200623

This Bid is submitted to:

City of Winchester, Virginia
Finance Department
Purchasing Division
Rouss City Hall, 1st Floor
15 North Cameron Street
Winchester, Virginia 22601

In submitting this Bid, bidder acknowledges that the bidder has examined copies of the following Contract Documents:

1. Invitation to Bid
2. Instructions to Bidders
3. Bid Form
4. Bid Bond
5. Non-Collusion Affidavit
6. Performance Bond
7. Labor and Material Payment Bond
8. General Conditions
9. Special Conditions
10. Technical Specifications
11. Contract Drawings
12. All of the following Addenda:

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>DATE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Receipt of all of above is hereby acknowledged.

CONTRACTOR: _____

BY (SIGNATURE): _____

NAME AND TITLE: _____

DATE: _____

The undersigned Bidder proposes to complete all work in accordance with the Contract Documents for the following unit prices:

Base Bid

		Total Estimated			
No.	Description	Unit	Quantity	Unit Cost	Cost
1	Mobilization	LS	1		
2	VDOT STD DI-3B, L=14'	EA	1		
3	VDOT STD DI-3B, L=20'	EA	2		
4	VDOT STD JB-1	EA	1		
5	18" Reinforced Concrete Pipe	LF	252		
6	24" Reinforced Concrete Pipe	LF	71		
7	30" Reinforced Concrete Pipe	LF	149		
8	Grassed Drainage Swale	LF	152		
9	Riprap	TON	8		
10	Water Main Relocation	LF	60		
11	Aggregate Subbase Course, VDOT 21-A	TON	11		
12	Base Course Asphalt, BM-25.0	TON	8		
13	Surface Course Asphalt, SM-9.5A	TON	3		
14	Traffic Control	LS	1		

TOTAL BID: \$ _____

IN WORDS: _____

CONTRACTOR: _____

BY: (SIGNATURE) _____

NAME AND TITLE: _____

DATE: _____

ADDRESS: _____

TELEPHONE: _____

CURRENT VIRGINIA CONTRACTOR REGISTRATION NUMBER: _____

NOTE: REQUIRED BID GUARANTEE MUST BE ENCLOSED WITH

THIS BID PROPOSAL.

Betty's Lane Drainage Improvements
ITB # 200623

CONTRACT

THIS CONTRACT, made and entered into in triplicate originals this ____ day of _____, **2006**, by and between the **City of Winchester, Virginia**, Party of the First Part, hereinafter referred to as the "**Owner**" and _____, Party of the Second Part, hereinafter referred to as the "**Contractor**".

WITNESSETH, That the Contractor and the City for the consideration stated herein agree as follows:

ARTICLE I, SCOPE OF WORK - The Contractor shall perform everything required to be performed and shall provide and furnish all of the labor, materials, necessary tools, expendable equipment and all utility and transportation services required to perform and complete in a workmanlike manner all the work required in connection with:

Betty's Lane Drainage Improvements

all in strict accordance with the Contract Documents prepared by the Engineering Department, City of Winchester, Virginia. The Contractor shall do everything required by this Contract and other Documents constituting a part thereof.

ARTICLE II, CONTRACT PRICE - The City shall pay to the Contractor for the performance of this Contract, subject to any additions or deductions provided therein, in current funds, the Contract Price computed as follows:

TOTAL CONTRACT PRICE= _____

ARTICLE III. PAYMENTS - Payments are to be made to the Contractor in accordance with and subject to provisions embodied in the Documents made a part of this Contract.

ARTICLE IV. CONTRACT TIME - Work under this Contract shall commence no later than the date to begin work set forth in a written Notice to Proceed from the City or its authorized representative, to the Contractor, said stipulated date to begin work being no sooner than ten (10) days following the date of said written Notice to Proceed. The Contractor shall complete all base bid work under this Contract within ninety (90) **calendar days**, with said date being the "Contract Completion Date" or "Time of Completion".

The Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of

progress as will insure full completion thereof within the time specified. It is expressly understood and agreed by and between the Contractor and the City that the time for the completion of the Work described herein is a reasonable time for the completion of the same, taking into consideration average climatic range and usual industrial conditions prevailing in this locality.

ARTICLE V. ENGINEER – The project has been designed by The City of Winchester Public Services Department, Engineering Division, 15 N. Cameron Street, Winchester, VA 22601, who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE VI. HOLD HARMLESS CLAUSE - Bids shall provide that during the term of the Contract, including warranty period, for the successful bidder indemnifying, defending, and holding harmless the City, its officers, employees, agent and representatives thereof from all suits, actions, claims of any kind, including attorney's fees, brought on account of any personal injuries, damages, or violation of rights sustained by any person or property in consequence of any neglect in safeguarding contract work, or on account of any act or omission by the Contractor or his employees, or from any claims or amounts arising from violation of any law, bylaw, ordinance, regulation or decree. The Contractor agrees that this clause shall include claims involving infringement of patent or copyrights.

ARTICLE VII. LIQUIDATED DAMAGES - It is hereby fully understood and agreed that the time is of essence in the performance of this Contract. For each and every calendar day that elapses between the Contract Completion Date and the date on which the work covered by such Contract is actually completed, including the removal of all plant and obstructions from the site of such work, the Contractor shall pay to the City as liquidated damages and not as a penalty, the sum of FIVE HUNDRED DOLLARS (\$500.00). The total amount so payable by the Contractor as liquidated damages either may be deducted from any moneys due or payable to the Contractor by the City or so much thereof as is not so deducted shall be chargeable to and will be payable promptly by such Contractor and his Surety, or either of them, to the City. Such liquidated damages shall be payable to reimburse or compensate, at least in part, the City for (1) the administration of the work covered by such Contract and any other contract or contracts beyond the Contract Completion Date, including the additional expense to the City for supervision, inspection, and superintendence; (2) expenditures resulting from the inability of the City (and the general public) to use the improvement being constructed from and after such Contract Completion Date until the actual date of completion; (3) other miscellaneous obligations and expenditures incurred by the City directly as a result of the failure to complete the Work covered by such Contract on or before the Contract Completion Date.

ARTICLE VIII. COMPONENT PARTS OF THIS CONTRACT - That this Contract consists of the following component parts which are made a part of this agreement and Contract as fully and absolutely as if they were set out in detail in this Contract:

1. Invitation to Bid
2. Instructions to Bidders
3. Bid Form
4. Bid Bond
5. Non-Collusion Affidavit
6. Performance Bond
7. Labor and Material Payment Bond
8. General Conditions
9. Special Conditions
10. Technical Specifications
11. Contract Drawings
12. Addenda

Above components are complimentary and what is called for by one shall be binding as if called by all.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the date first written above.

CONTRACTOR:

CITY OF WINCHESTER, VIRGINIA:

EDWIN DALEY, CITY MANAGER

NAME AND TITLE

ATTEST

ATTEST

BID BOND

KNOW ALL MEN BY THESE PRESENTS THAT_____

(Here insert the name & address or legal title of the Contractor)

as Principal, hereinafter called the Contractor and _____

(Here insert the legal title of the Surety)

as Surety, hereinafter called the Surety, are held and firmly bound unto the City of Winchester, Virginia, as obligee, hereinafter called the Owner, in the amount of

(Dollars)

(\$_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid for:

**Betty's Lane Drainage Improvements
ITB # 200623**

in accordance with Drawing and Specifications prepared by the Public Services Department, City of Winchester, Virginia.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Obligee shall accept the Bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with terms of such Bid, and give such bonds as specified in the Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bonds, if the Principal shall pay the Obligee the difference not to exceed the penalty hereof between the amount specified in said Bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said Bid, then this obligation shall be null and void, otherwise to remain in

full force and effect.

SIGNED AND SEALED THIS _____ DAY OF _____ A.D., 2006.

PRINCIPAL

TITLE

WITNESS

SURETY

TITLE

WITNESS

NON-COLLUSION AFFIDAVIT

STATE OF VIRGINIA

Ss: Betty's Lane Drainage Improvements
ITB # 200623

CITY OF WINCHESTER, COUNTY of FREDERICK

I, _____ of the City of _____

In the County of _____ and the State of _____

Of full age, being duly sworn according to law or my oath depose and say that:

I am _____ of the firm of _____

_____, of the Company making the Bid for the above named project, and that I executed the said Bid with full authority to do so; that the Company has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bid preparation in connection with the above named project; and that all statements contained in said Bid and in this affidavit are true and correct, and made with full knowledge that the City of Winchester relies upon the truth of the statements contained in said Bid and in the statements contained in this affidavit in awarding the Contract for said Project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by:

(Name of Contractor)

Subscribed and sworn to _____
(Type or print name of applicant under signature)

before me this _____ day of _____, 20____.

(Notary Public)

of _____

My commission expires: _____, 20____.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____

_____ as Principal, hereinafter

called Contractor, and _____

Surety Company, with General Offices in _____

_____, a corporation organized under the laws of the State of _____ and authorized to transact business in the State of Virginia as Surety, hereinafter called Surety, are held and firmly bound onto the City of Winchester, Virginia, as Oblige, hereinafter called Owner, in the penal sum _____

(_____) Dollars, lawful money of the United States, for the payment of which sum, will and truly be made, the Said Contractor and Surety bind themselves, their successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed and delivered this _____ day of _____, 2006.

WHEREAS, the above named and bounded Contractor has entered into a written contract with the Owner, dated _____, 2006 for:

**Betty's Lane Drainage Improvements
ITB# 200623**

in accordance with the Drawings and Specifications prepared by the Engineering Department, City of Winchester, Virginia, which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or

2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of contract price," as used in this paragraph, shall mean the total amount payable by the Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this _____ day of _____ 2006.

PRINCIPAL

SURETY

TITLE

TITLE

WITNESS

WITNESS

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____

_____ as Principal, hereinafter

called Contractor, and _____

Surety Company, with General Offices in _____

_____, a corporation organized under the laws of the State of _____ and authorized to transact business in the State of Virginia as Surety, hereinafter called Surety, are held and firmly bound unto the City of Winchester, Virginia, as Obligee, hereinafter called Owner, in the penal sum

(_____)Dollars, lawful money of the United States, for the payment of which sum, will and truly be made, the Said Contractor and Surety bind themselves, their successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed and delivered this _____ day of _____ 2006.

WHEREAS, the above named and bounded Contractor has entered into a written contract with the Owner, dated _____, 2006 for:

Betty's Lane Drainage Improvements ITB # 200623

in accordance with the Drawings and Specifications prepared by the Engineering Department, City of Winchester, Virginia, which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Contractor shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the

Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgement for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:
 - a) Unless claimant, other than the one having a direct Contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage paid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
 - b) After the expiration of one (1) year following the date on which Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanic's liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this _____ day of _____, 2006.

PRINCIPAL

TITLE

WITNESS

SURETY

TITLE

WITNESS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

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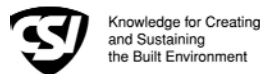
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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of

acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and

other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially

complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. *Intent of Certain Terms or Adjectives*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

- a. does not conform to the Contract Documents, or
- b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
- c. has been damaged prior to Engineer's - recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project

Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other

submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations.

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor

shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS;
SUBSURFACE AND PHYSICAL CONDITIONS;
HAZARDOUS ENVIRONMENTAL CONDITIONS;
REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not

Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 Differing Subsurface or Physical Conditions

A. Notice: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. Engineer's Review: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

- b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

- a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

- b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but

not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

- a. reviewing and checking all such information and data,
- b. locating all Underground Facilities shown or indicated in the Contract Documents,
- c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and
- d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Under-

ground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible

property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-

made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if

possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project

or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect

of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or

received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will preju-

dice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will

advise Contractor in writing of any negative determination.

D. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of

any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer,, and all other

individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and

safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written

notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 Continuing the Work

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation

acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 Delegation of Professional Design Services

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria

given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by

others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on

information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment

, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the

requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all

maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph

13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 Notification to Surety

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 Claims

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract

Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,
2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 Cost of the Work

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional

or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories,

surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such

losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals

and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective

Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may

make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and
- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
- b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

- a. to supervise, direct, or control the Work, or
- b. for the means, methods, techniques, sequences, or procedures of construction, or the

safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
- b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
- c. there are other items entitling Owner to a set-off against the amount recommended; or
- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work

substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of

inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will

return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the

Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner,

terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a

Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or
2. agrees with the other party to submit the Claim to another dispute resolution process, or
3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SPECIAL CONDITIONS

1.01 Before any work at the site is started, Contractor shall deliver to Owner an executed Certificate of Insurance. The Certificate shall indicate that the required insurance is in force and state that the policies will not be materially changed or canceled without a thirty (30) day advance notice by registered mail to Owner and Engineer. The representative signing the Certificate shall furnish evidence that he is authorized to so sign as well as his address and the name and address of the agency or agencies through which the insurance was obtained. Contractor shall take out and maintain the following insurance:

1.02 Contractor's Comprehensive General Liability (bodily injury and property damage) shall be provided for the following limits:

A. Bodily Injury Liability 1,000,000 dollars each occurrence
 1,000,000 dollars annual aggregate

B. Property Damage Liability 500,000 dollars each occurrence
 500,000 dollars annual aggregate

C. Or combined single limit 1,500,000 dollars

D. The general liability insurance shall include the following coverages:

1. Comprehensive Form

2. Premises - Operation

3. Explosion and Collapse Hazard

4. Underground Hazards

5. Products/Completed - Operations Hazards

6. Contractual Liability Insurance

7. Broad Form Comprehensive General Liability, Property Damage, including Completed Operations

8. Independent Contractors (Contractor's Protective Liability)

9. Personal Injury (all insuring agreements), Deleting the Employee Exclusion

10. If protection is under an umbrella policy, it shall not exclude any of the above items under the basic policy.

1.03 Contractor's Automobile Liability (bodily injury and property damage) shall be provided for the following limits:

holidays. If the Contractor wishes to prosecute any portion of the Work on Saturdays, Sundays or legal holidays, he shall first obtain written permission from the Engineer. Such requests shall be submitted at least 48 hours in advance of the period proposed for such overtime work.

3. **PROGRESS PAYMENTS**

- 3.01 The basis for payments shall be the actual quantity of work completed, as determined in field by the Engineer.
- 3.02 An amount equal to five percent (5%) of each progress payment shall be held from each payment as retainage.

4. **HOLD HARMLESS CLAUSE**

- 4.01 Bids shall provide that during the term of the Contract, including warranty period, for the successful bidder indemnifying, defending, and holding harmless the City, its officers, employees, agent and representatives thereof from all suits, actions, claims of any kind, including attorney's fees, brought on account of any personal injuries, damages, or violation of rights sustained by any person or property in consequence of any neglect in safeguarding contract work, or on account of any act or omission by the Contractor or his employees, or from any claims or amounts arising from violation of any law, bylaw, ordinance, regulation or decree. The Contractor agrees that this clause shall include claims involving infringement of patent or copyrights.

5. **LEGALLY REQUIRED PROVISIONS**

- 5.01 Drug free workplace: During the performance of this contract, the Contractor agrees to (i) provide a drug-free workplace for the Contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions are binding upon each subcontractor or vendor.

For the purposes of this section, "*drug-free workplace*" means a site for the performance of work done in connection with a specific contract awarded to a Contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

5.02 Employment Discrimination by Contractor Prohibited.

In every contract over \$10,000 the provisions in 1. and 2. below apply:

1. During the performance of this contract, the Contractor agrees as follows:
 - a. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - b. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.
 - c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
2. The Contractor will include the provisions of 1. above in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

5.03 Prompt Payment of Bills

1. To Prime Contractor:
 - a. Invoices for items ordered, delivered and accepted shall be submitted by the Contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the contract number and/or the purchase order number; social security number (for individual contractors) or the federal employer identification number (for proprietorships, partnerships, and corporations).
 - b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.
 - c. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the Contractor at the contract price, regardless of which public agency is being billed.
 - d. The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail.
 - e. Unreasonable Charges: Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges.

Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced charges are not reasonable, the City shall promptly notify the Contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A Contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification. The provisions of this section do not relieve an agency of its prompt payment obligations with respect to those charges, which are not in dispute.

2. To Subcontractors:
 - a. A Contractor awarded a contract under this solicitation is hereby obligated:
 - (1) To pay the subcontractor(s) within seven (7) days of the Contractor's receipt of payment from the City for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or
 - (2) To notify the agency and the subcontractor(s), in writing, of the Contractor's intention to withhold payment and the reason.
 - b. The Contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the Contractor that remain unpaid seven (7) days following receipt of payment from the City, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A Contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the City.

6. **MISCELLANEOUS OTHER CONDITIONS**

- 6.01 It shall be the responsibility of the Contractor to locate utilities in the field. Contractor shall give all utility companies that may have subsurface or surface utilities in the area adequate notice at least 48 hours in advance that the Contractor is to perform work in this area.
- 6.02 The attention of the Contractor is drawn to the fact that the possibility exists of the Contractor encountering various water, chemical, electrical, or other lines. Contractor shall exercise extreme care before and during construction to locate and flag these items so as to avoid damage to existing lines. Should damage occur to an existing line, the Contractor shall repair the line at no cost to the Owner. Temporary support, adequate protection and maintenance of all underground and surface utility installations and

structures, drains, and other obstructions encountered in the progress of the work shall be provided by the Contractor at his own expense.

- 6.03 Contractor shall be responsible for the temporary removal and re-installation of structures including, but not limited, to piping, conduits, drains, that may interfere with the work. The cost of such work shall be included in the Bid for the project and shall not result in any additional cost to the Owner. It shall be the Contractor's responsibility to contact and obtain permission from various authorities having jurisdiction over such structures, prior to start of the work.
- 6.04 Local drainage is not to be blocked. Shoulders, ditches, and drainage facilities shall be kept clear at all times and in condition satisfactory to the Engineer.
- 6.05 Adequate barricades, construction signs, red lanterns and guard as required shall be placed and maintained during the course of the work, and until it is safe for the pedestrian and vehicular traffic to use the area. The rules and regulations of the Local and State and Federal authorities respecting safety provisions shall be observed.
- 6.06 All work is subject to inspection by the City of Winchester.
- 6.07 The Contractor shall be responsible to establish and maintain communications with the residents and business owners of the area affected by the construction. The purpose of this communication is to notify the residents and business owners of construction activities which affect them, and to coordinate accommodations for them during construction.

*****END SPECIAL CONDITIONS*****

Section 01000 – General Provisions

Part 1 – General

1.1 DESCRIPTION

1. Purpose: This section provides information applicable to all sections included in these Specifications.
2. Work Included: The work to be performed hereunder shall include the furnishing of all labor, materials, tools, transportation, supplies, equipment and appurtenances necessary for the complete and satisfactory construction of the Betty's Lane Drainage Improvements project.

1.2 REFERENCES

1. Abbreviations: The term "Specifications", "Technical Specifications", or "Spec" refers to all sections of the Contract Documents listed under the Technical Specifications – Table of Contents.

Reference to the following documents is made within the Specifications using the abbreviations listed below. Specific sections within these documents are included by reference throughout the Specifications. Further references made, within these documents, to other sections or documents are included implicitly in these Specifications.

<u>Abbreviation</u>	<u>Referenced Document</u>
MUTCD Standards	Federal Highway Administration Manual of Uniform Traffic Control Devices
VDOT Specification(s)	Virginia Department of Transportation – Road and Bridge Specifications, latest edition
VDOT Standard(s)	Virginia Department of Transportation – Road and Bridge Standards, latest edition
VESCH Spec(s)	Virginia Department of Conservation and Recreation – Virginia Erosion and Sediment Control Handbook, latest edition
WINC Spec(s) & Std(s)	City of Winchester Water and Sewer Specifications and Standards

1.3 WASTE AREAS

1. General: Disposal of debris will be carried out in accordance with VDOT Road and Bridge Specifications, Section 106.04, except that the CONTRACTOR shall be responsible for obtaining the rights to any waste area for disposal of debris. All work in disposing of such material shall be considered incidental to the work. All disposal must conform to the solid waste disposal permit regulations as issued by the Commonwealth of Virginia and the City of Winchester, VA. CONTRACTOR shall obtain necessary permits at no cost to the OWNER.
2. Lack of Applicable Specification: In the event that a work item shown on the plans is not adequately specified in terms of materials, basis for payment, or

otherwise, the CONTRACTOR shall contact the ENGINEER so that such specification may be made.

END OF SECTION

Section 01025 – Measurement and Payment

Part 1 – General

1.1 DESCRIPTION

1. General: The contract unit prices will be applied to the actual quantities constructed. This section describes the process by which these quantities will be measured.

Part 2 – Measurement

1. Basis for Measurement and Payment: All work shall be paid on the basis of the Unit Prices stated in the Bid Form and upon the actual work performed and materials installed, complete-in-place, in accordance with the Contract Documents. No separate payment shall be made for such items as the constant maintenance and coordination of the work, incidental utility excavation, excavation, trench protection, utility support and coordination, sheeting and shoring, underpinning, installation procedure, dewatering, utility backfill, backfill, pavement sawcutting, cutting and removal, inspection, testing and restoration except when specified otherwise. The expense for these and any other incidental or related work necessary to provide and install a Bid Item, complete-in-place, shall be included in the Unit Price for that particular Bid Item. All work indicated or implied for a complete and finished installation shall be included in one of the several unit prices.

1) Mobilization: The performance of construction preparatory operations, including the movement of personnel and equipment to the project site, payment of performance and payment bond, other insurance premiums, payment of permit fees, and for the establishment of other facilities necessary to begin the work. Mobilization shall also include preparing and applying for any permits necessary to complete the work. Mobilization will be paid for at the contract lump sum price, and paid in two installments which price will be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment and incidentals necessary to mobilize and subsequently demobilize the construction preparatory operations. Payment for this item will be paid for at the lump sum price bid for mobilization.

The lump sum (LS) price paid for mobilization shall be no more than three percent (3%) of the total contract amount.

No additional payment will be made for demobilization and remobilization due to shutdowns, suspensions of the work or for other mobilization activities.

Payment for mobilization will be made in two installments. The first payment, 50 percent of the lump sum price, will be made on the first estimate following mobilization and the initiation of construction work. The second and final payment will be made on the next estimate following the completion of substantial mobilization.

2) Storm Drainage Pipe: Shall be measured and paid for per linear foot, for each pipe size specified or indicated, regardless of class indicated. Bids shall be based on reinforced concrete pipe. Measurements shall be made of the actual horizontal length, except where indicated otherwise. The linear foot price shall include all labor, equipment and materials for the pipe, excavation, shoring, bedding, removal and proper disposal of all excavated materials, backfill, compaction, connections, pavement repairs, restoration of property, removal of existing pipes, abandonment of existing pipes, manholes and inlets, including plugs, removal of existing pavement, coordination with utility companies, testing and any other work required for a complete installation.

3) Storm Drainage Inlets: Shall be paid for at the unit price bid for each, complete-in-place. The unit price shall include all equipment, labor and materials for excavation, backfill, bedding material, gutter and curtain wall, concrete inlet including the base, both cast-in-place and precast, the frame and cover, grate, if required, invert shaping, pipe installation, special construction techniques, removal and disposal of existing inlets (as necessary), testing and any other item required for a complete installation.

4) Storm Drain Junction Boxes: Shall be paid for at the unit price bid for each complete-in-place. The unit price shall include all equipment, labor and materials for sheeting and shoring, excavation, backfill, bedding material, concrete manhole, the frame and cover, pipe installation, steps, the concrete riser and cone, invert shaping, grouting, special construction techniques, testing and any other item required for a complete installation.

5) Water Main Relocation: Shall be paid for at the unit price per linear foot of pipe through all valves and fittings, complete in place. This price shall include excavating, testing, disinfecting, backfilling, compacting, dewatering, disposing of surplus and unsuitable material, sheeting and shoring, bedding material, installing pipe, connecting to existing lines, fittings, reaction blocking, concrete anchor block, watertight welds, restrained joints, abandoning or removing lines and other appurtenances, and restoring property.

6) Grassed Drainage Swale: Shall be paid for at the unit price per linear foot of ditch based on the provided cross-section diagram. This price shall include all excavation, backfilling, compacting, disposal of surplus material, geotextile fabric, and restoring property.

7) Riprap: Shall be paid for at the contract unit price. This price shall include furnishing and placing stone, including excavation and riprap bedding.

8) Asphalt Driveway Paving: Shall be measured by the ton (2000 pounds) complete in place and accepted asphalt paving. Weight shall be determined by a certified scale approved by the OWNER and recorded on serially numbered weight tickets, identifying the vehicle and presented to the OWNER's representative on the job. Work performed and materials furnished as prescribed by this item and measures as specified in this item shall be paid for at the contract unit price bid, for the type or types of courses and mixtures. The price shall be payment in full for quarrying, furnishing all materials, for all heating,

mixing, hauling, placing asphalt mixtures, rolling and finishing, and for all labor, tools, equipment, testing and incidentals necessary to complete the work. Paving tickets shall be submitted to the ENGINEER. This price shall be used only for driveway pavement. Pavement for street repair shall be included in other items.

9) Aggregate Subbase for Driveway: Work and accepted materials as specified for this item shall be measured by the ton (2000 pounds) of complete-in-place aggregate subbase. The work performed and material placed as prescribed for this item, shall be paid for at the unit price bid per ton for aggregate subbase which price shall be full compensation for furnishing the material, hauling, blading, sprinkling, compacting, testing, removal and disposal of existing material, and furnishing of all labor and equipment necessary to complete the work. This price shall be used only for driveway construction. Subbase material for street repair shall be included in other items.

10) Traffic Control: Equipment, material and labor required for the safe and efficient maintenance of traffic shall be measured as a lump sum price. This price shall be full compensation for supplying, placing, moving, and maintaining all barriers, signs, arrow boards, temporary pavement markings, variable message boards, installing traffic control devices during construction and removing the measures once construction is completed.

END OF SECTION

Section 01040 – Manner of Conducting Work

Part 1 – General

1.1 WORK AREA

1. General: Clean up the work area daily and at all times maintain the project in a neat and orderly manner consistent with normal operation. Execute the work and furnish such temporary facilities as required to preclude interference with access to existing buildings and structures and to cause no possible interference with the operation of essential service. Fill any open trenches per the City of Winchester Public Utilities Standards, latest edition.
2. Right-of-Way and Easements: It is imperative that the CONTRACTOR work within the right-of-way or easements at all times, unless approved by the property owner and the ENGINEER.

END OF SECTION

Section 01045 – Maintenance and Coordination

1. TRAFFIC MAINTENANCE AND COORDINATION

- A. The CONTRACTOR shall provide and maintain, at his expense, all signs, cones, barricades, stands and flagmen required to control and protect traffic passing through and around the work zone.
- B. The method of controlling the traffic passing through a work zone shall be in accordance with the Virginia Supplement to the Federal Highway Administration "Manual of Uniform Traffic Control Devices" and the VDOT Work Area Protection Manual.
- C. The CONTRACTOR shall keep the street intersections at the ends of the current work areas open to traffic. When work is perpendicular to the street, the CONTRACTOR shall work in no more than one-half (1/2) of the street width at one time. The first half of the work must be completed and the street passable prior to working in the second half.
- D. The CONTRACTOR shall provide the necessary diversion ditches, dikes or temporary culverts required to prevent mud and debris from being washed onto the streets or property. The CONTRACTOR's vehicles shall be kept clean to prevent mud or dust from being deposited on streets.
- E. The CONTRACTOR shall provide and maintain a safe and passable pedestrian access for the public conducting business or residing within the work area. Sidewalks shall remain clear and open at all times during the work, unless approved otherwise by the OWNER.
- F. All debris and surplus material collected shall be disposed of off the work site by the CONTRACTOR, at his expense and in a legal manner.
- G. Access for emergency vehicles shall be maintained at all times.
- H. All trenches shall be closed at the end of each work day.

2. PROPERTY MAINTENANCE AND COORDINATION

- A. The CONTRACTOR shall notify the property owner(s) forty-eight (48) hours prior to working within easements located upon private property in order to coordinate a means of ingress and egress to the work area and determine a storage area for materials.
- B. The CONTRACTOR shall maintain a safe and passable vehicular entrance to all private or public property. The CONTRACTOR shall notify the property owner(s) twelve (12) hours in advance of the blocking of an entrance. The entrance shall not be blocked for more than twelve (12) hours at any one time, without approval of the OWNER.
- C. The CONTRACTOR shall notify the owner(s) of animals forty-eight (48) hours prior to working upon the property to allow the owner to relocate the animals, if possible. The CONTRACTOR shall maintain the integrity of the existing fences and gates during the work.
- D. Existing structures (buildings), lawn, trees, shrubs, fences, utilities, culverts, walls, walks, curb and gutter, driveways, poles, signs, right-of-way monuments, mailboxes and the like shall be protected from damage during the work under this contract. Any damage caused to such items shall be repaired or replaced by the CONTRACTOR at his expense.

- E. Tree and plant roots or branches that may interfere with the work shall be trimmed or cut only with the approval of the property owner. Any trees or plants which are shown to remain and do not interfere with the work but are accidentally damaged by the work shall be repaired by the CONTRACTOR at his expense.
- F. The CONTRACTOR shall obtain and pay for use of additional storage or work areas needed for operations under this Contract.

3. UTILITY MAINTENANCE AND COORDINATION

- A. Before the work is started, the CONTRACTOR shall notify all companies, corporations, municipalities and individuals who own utilities on the construction site, in the right-of-way or immediately adjacent to the construction area of the work to be performed. The CONTRACTOR shall arrange to have the various utilities located and to have them removed or relocated as required, or to determine the method of protection acceptable to the respective owner, if the method of protection is not specified hereinafter. Any cost incurred with removing or relocating utilities shall be borne by the CONTRACTOR unless indicated otherwise.
- B. The location of existing utilities shown on the drawings was taken from existing records and may not represent exact location. The CONTRACTOR shall excavate to located buried utilities far enough in advance of pipeline laying to allow for adjustments in pipe laying both horizontally and vertically.
- C. The work shall be coordinated and performed in a manner so that all existing fire hydrants, without exception, shall be accessible at any time during the work.
- D. The CONTRACTOR shall maintain the existing streams, ditches, drainage structures, culverts and flows at all times during the work. The CONTRACTOR shall pay for all personal injury and property damage which may occur as a result of failing to facilitate drainage.
- E. The CONTRACTOR shall ascertain the exact location of each existing utility that may interfere with the work. The CONTRACTOR may obtain field utility locations by calling "MISS UTILITY" (1-800-552-7001) forty-eight (48) hours prior to working in the vicinity of existing utilities. If the utilities fail to locate, a second call shall be made providing an additional three (3) hour notice.
- F. The CONTRACTOR shall repair or replace any utility damaged or misaligned during or due to the work. All other utilities shall be repaired or replaced by the respective Utility Company(s) at the expense of the CONTRACTOR.
- G. The CONTRACTOR shall coordinate all work within the vicinity of the existing utilities with the respective Utility Company. The work shall be conducted in a manner to avoid unnecessary service interruption and in accordance with the rules and regulations of the respective Utility Company.
- H. When the work is approaching and existing utility or structure that may be in conflict with, or connected to, the work, the CONTRACTOR shall excavate test pits to verify the location or elevation of the existing utility or structure. By taking this precaution the CONTRACTOR may adjust the work or have the existing utility relocated as necessary. Failure to take such precautions may result in the CONTRACTOR adjusting the work or having the existing utility relocated at his expense.
- I. The CONTRACTOR shall contact utilities with underground and overhead facilities in the project area or adjacent to the project area and request the utility to make safety arrangements to protect workers in the vicinity of the lines, in

- accordance with the Overhead Voltage Lines Safety Act (Section 59.1-406, et seq. of the Code of Virginia). The CONTRACTOR shall not proceed with work until such measures are in place. The invoice from the utility shall be paid directly by the CONTRACTOR.
- J. When the existing utilities cross the trench excavation, the existing utilities shall be adequately supported and protected from damage due to the work as required, specified or directed. All methods for supporting and maintaining the existing utilities shall be subject to the approval of the respective Utility Company and the OWNER. Any utilities removed as part of the work, and not indicated to be removed or abandoned, shall be restored using materials and installation equal to the Utility's standards.
 - K. The CONTRACTOR shall exercise care to insure that the grade and alignment of the existing utility be maintained and that no joints or connections are disturbed. Backfill shall be carefully placed and compacted to prevent future damage or settlement to the existing utility.

END OF SECTION

Section 01110 – Summary of the Work

Part 1 – General

1.1 DESCRIPTION

1. Work Included: The work to be performed hereunder shall include the furnishing of all labor, materials, tools, transportation, supplies, equipment and appurtenances necessary for the complete and satisfactory installation of the proposed drainage system. The work includes 525 LF of drainage pipe and associated drainage structure installation, 152 LF of grassed drainage swale, associated water main relocation, maintenance of traffic and associated construction items.

1.2 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract.
2. Inclusion: The referenced standards in their latest editions form a part of these specifications to the extent specified herein.
3. Precedence: It is the intent of these specifications that the work be in conformance with referenced standards but under no circumstances shall those referenced standards take precedence over the specifications. In any case of conflict, the requirements of the plans and these specifications shall prevail.

1.3 WASTE AREAS

1. General: Disposal of debris will be carried out in accordance with VDOT Road and Bridge Specifications, Section 106.04, except that the CONTRACTOR shall be responsible for obtaining the rights to any waste area for disposal of debris. All work in disposing of such material shall be considered incidental to the work. All disposal must conform to the solid waste disposal permit regulations as issued by the Commonwealth of Virginia and the City of Winchester, VA. CONTRACTOR shall obtain necessary permits at no cost to the OWNER.

1.4 PUBLIC SAFETY

1. General: The CONTRACTOR shall maintain the work area in a condition such that the safety of the public is not endangered. This may include, but not be limited to, the installation of temporary barricades, lighting and walkways as deemed necessary by the OWNER and the ENGINEER.
2. Pedestrian Access: The CONTRACTOR shall maintain pedestrian access through the work area whenever possible. When pedestrian access is not possible, the CONTRACTOR is responsible for providing a well-signed pedestrian detour. A copy of the proposed detour must be submitted to and approved by the OWNER prior to execution.

1.5 EXCAVATION

1. General: Excavation shall be in accordance with Section 02317 – Excavation, Trenching and Backfilling for Utilities

1.6 COORDINATION

1. General: The CONTRACTOR shall notify the OWNER or tenant of such property upon which work is to be performed in advance of commencing work thereon, and in the event of the necessity of disrupting utility or other services to such property, he shall notify the appropriate official in charge of such utility or other services and arrange for the disruption and restoration of such service in a manner which will result in a minimum of inconvenience to parties concerned.

1.7 UTILITIES

1. General: The CONTRACTOR shall contact the appropriate utility companies (Miss Utility) and have utilities field located prior to construction.
2. Existing Utilities: If damage to existing utilities occurs during construction, the CONTRACTOR shall report the damage immediately to the OWNER and shall immediately, at the CONTRACTOR's expense, if due to CONTRACTOR's negligence, repair or arrange for repair of the damaged utilities to the satisfaction of the utility owner.

1.8 PRECONSTRUCTION AUDIO-VISUAL SURVEY

1. General: A preconstruction audio-visual survey shall be conducted as described in Section 01330 – Submittal Procedures.

END OF SECTION

Section 01330 – Submittal Procedures

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: The CONTRACTOR shall provide submittals for the ENGINEER's approval to show compliance with the specifications. Unacceptable submittals shall be revised and resubmitted as necessary until compliance with the specifications is achieved. If the CONTRACTOR fails to provide an acceptable submittal during the second review, the CONTRACTOR will be responsible for all fees associated with additional reviews.

1.2 QUALITY ASSURANCE

1. Coordination of Submittals: The CONTRACTOR shall be responsible for reviewing the Specifications to ensure that the items being submitted conform in all respects with the requirements. All submittals shall be provided to the ENGINEER at least 2 weeks prior to commencing work on items being submitted.
2. Substitutions:
 - 1) The CONTRACTOR is bound to the standards of quality established in the Contract Documents. Refer to Section 6.05 of the General Conditions regarding "Substitutes and/or Equals."
 - 2) The substitution of materials, equipment or methods shall not be permitted unless prior approval for the substitution has been given in writing by the ENGINEER.
 - 3) The CONTRACTOR shall certify that the proposed substitution has been determined to be equal or superior to the product and/or construction method specified. The proposed substitution shall be in complete compliance with the provisions in the Contract Documents.

PART 2 – PRODUCTS

2.1 SUBMITTALS

1. General: The CONTRACTOR shall comply with Section 6.17 of the General Conditions regarding "Shop Drawings and Samples."
2. Submissions: Submittals will be stamped by the ENGINEER in one of the following ways:
 - 1) "No Exceptions Taken" – No exceptions are taken, subject to compliance with the Contract Documents.
 - 2) "Furnish As Corrected" – Minor corrections are noted and a resubmittal is not required, subject to compliance with the corrections and the Contract Documents.
 - 3) "Rejected – See Remarks" – The submittal material, method or system is totally rejected and does not meet the intent of the Specifications.
 - 4) "Revise and Resubmit" – Revision prior to resubmittal is required.

3. Submission Procedures: The CONTRACTOR shall provide a minimum of 4 copies of each submittal to the OWNER for review. The Resident Project Representative receives 1 copy, the OWNER receives 2 copies, and the CONTRACTOR receives the remaining copy.

2.2 SHOP PLANS

1. Scale and Measurement: Shop plans shall be to a scale sufficiently large to show all pertinent aspects of the item.
2. Review Comments: The ENGINEER will show all review comments on each copy of the submittal to be distributed as stated in Section 2.1.

2.3 MANUFACTURER'S LITERATURE

1. General: The CONTRACTOR shall provide all manufacturer's data pertinent to the submittal, clearly showing which portions of the contents are being provided for review.

2.4 RECORD PLANS

1. General: The CONTRACTOR shall submit to the ENGINEER at the final completion inspection, certified record plans of the project. The ENGINEER shall provide the CONTRACTOR with one set of blueline plan sheets upon request. The record plans shall show all changes to the horizontal location and elevations of all structures and piping. The record plans shall be certified by a licensed Engineer or Land Surveyor.

2.5 PRECONSTRUCTION AUDIO-VISUAL SURVEY

1. General: Prior to starting construction, CONTRACTOR shall perform an audio-visual survey of the project site. Record shall be printed on new, high-resolution color tape. Video display will show location, description of existing structures and landscaping, including time, date, address, and compass direction of travel and view. Footage shall be correlated to plan stationing. Vulnerable, damaged, or deteriorated areas within the zone of influence will be shown. Travel speed shall be approximately 50 feet per minute with a minimum camera elevation of 5 feet over the work with a minimum 30-foot width showing construction area. Recording must be compatible with standard VCR, ½" tape, VHS playback equipment or DVD player. Beta is unacceptable. Index correlated to bluelines shall be provided. CONTRACTOR shall provide copies to the ENGINEER/OWNER at the Preconstruction Conference. CONTRACTOR shall provide a remake of any tape not to OWNER's satisfaction. Any remakes shall be at no additional expense to the OWNER.

PART 3 – EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

1. Numbering: All submittals shall be consecutively numbered. Resubmittals shall cite the original submittal number for reference.

2. Transmittal: Each submittal shall be accompanied by a transmittal letter showing all the information required for identification and checking, including the appropriate Specification sections.
3. Submittal Log: The CONTRACTOR shall maintain a submittal log for the duration of the Work that indicates current status of all submittals. The submittal log shall be available to the ENGINEER at all times for their review.

3.2 ENGINEER'S REVIEW

1. General: Review by the ENGINEER does not relieve the CONTRACTOR from responsibility for errors which may result from the submitted data.
2. Revisions: All revisions requested by the ENGINEER will be required. If the CONTRACTOR is considering any additional required revisions, he shall notify the ENGINEER as provided in the General Conditions.

END OF SECTION

Section 01332 – Project Site Administration

1.1 CONSTRUCTION SUPERVISION

1. General: The CONTRACTOR shall be responsible for providing a job site supervisor knowledgeable in the field of work being performed. The supervisor shall be the point of contact for representatives of the OWNER and ENGINEER. The supervisor shall be responsible for coordination of the work performed under this contract.

1.2 JOB SITE SAFETY

1. General: The job site supervisor shall also be responsible for administering the appropriate site safety measures while work is being performed at the site.

END OF SECTION

Section 01450 – Testing Laboratory Services

Part 1 – General

1.1 DESCRIPTION

1. Work Included: The CONTRACTOR shall be responsible for providing an independent testing laboratory for analysis of field samples. The testing laboratory shall be approved by the OWNER. Should any test results be unacceptable, the CONTRACTOR will at no cost provide the additional testing necessary.

1.2 REFERENCES

1. General: The work shall comply with the most recent or tentative standards as published at the date of the contract and as listed in the Specifications using abbreviations shown.
2. American Society for Testing and Materials (ASTM):
 - 1) D 3740 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
 - 2) E 329 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.3 QUALITY ASSURANCE

1. General: The independent testing laboratory must be authorized to operate in the State of Virginia and be regularly engaged in this type of work, and approved by the OWNER. The laboratory shall maintain a full-time registered engineer on staff to review services.
2. Testing: All testing shall be performed in accordance with ASTM E 329 and ASTM D 3740.
3. Personnel: Individuals taking and performing the field tests shall have the proper training and qualifications.

1.4 LABORATORY RESPONSIBILITIES

1. Test compaction of subgrade and fill materials, aggregate and pavement materials, concrete and other construction materials in accordance with VDOT testing requirements and these specifications.
2. Provide qualified personnel at site after due notice; cooperate with OWNER and CONTRACTOR in performance of services.
3. Perform specified inspection, sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly (by fax) notify OWNER and CONTRACTOR of observed irregularities or non-conformance of work or products.
6. Perform additional inspections and tests required by the OWNER.

1.5 LIMITS ON TESTING LABORATORY AUTHORITY

1. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
2. Laboratory may not approve or accept any portion of the work.
3. Laboratory may not assume any duties of the CONTRACTOR.
4. Laboratory has no authority to stop work.

1.6 CONTRACTOR RESPONSIBILITIES

1. Cooperate with laboratory personnel, and provide access to Work, samples of materials, and to manufacturer's facilities, when required.
2. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
3. Notify OWNER and laboratory of any additional samples or testing that is required by the CONTRACTOR beyond the initial tests to be paid for by the OWNER.

Part 2 – Products

2.1 PAYMENT FOR TESTING

1. Testing Services: The CONTRACTOR shall be responsible for paying for all testing services.
2. Retesting: When initial test indicate noncompliance with the Contract Documents, subsequent retesting will be necessary and shall be performed by a lab approved by the OWNER. The additional costs incurred from these tests will be the responsibility of the CONTRACTOR.
3. Additional Testing: Should additional testing be requested by the OWNER, the cost of such testing shall be borne by the OWNER.
4. Employment of Laboratory: Employment of laboratory shall in no way relieve the CONTRACTOR of obligation to perform work in accordance with the requirements of the Contract Documents.

2.2 CONTRACTOR SUBMITTAL

1. Prior to start of work, submit testing laboratory name, address, telephone number, and names of full-time registered engineer and responsible officer to OWNER and ENGINEER for approval.
2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of Nation Bureau of Standards during most recent tour of inspection with memorandum of remedies of any deficiencies reported by the inspection.

2.3 LABORATORY REPORTS

1. Within 48 hours after each inspection and test, promptly submit two (2) copies of laboratory report to ENGINEER/OWNER and one (1) to CONTRACTOR. Include: date issued, project title and number, name of inspector, date and time

of sampling or inspection, identification or product and specification section, location in the project, type of inspection or test, date of test, results of test, and conformance with Contract Documents.

Part 3 – Execution

3.1 COOPERATION WITH TESTING LABORATORY

1. General: Representatives of the testing laboratory shall have access to the work site at all times and at all locations where work is in progress.

3.2 TAKING SAMPLES

1. General: All specimens and samples shall be taken and cured/prepared by the Independent Testing Laboratory, unless otherwise provided for in the Contract Documents. All sampling equipment shall be provided by the Independent Testing Laboratory for services being provided. The CONTRACTOR shall provide the equipment and labor necessary to prepare the site for the testing to be performed. All specimens and samples shall be delivered to the testing laboratory by the Independent Testing Laboratory personnel unless otherwise provided for in the Contract Documents.

3.3 SCHEDULE FOR TESTING

1. Schedule: The CONTRACTOR shall schedule and allow adequate time for the necessary testing to be performed and results received from the testing laboratory. When field sampling or testing is required to be witnessed by the ENGINEER or Resident Project Representative, the CONTRACTOR shall schedule such work with the ENGINEER or Resident Project Representative at least 48 hours in advance.
2. Revising Schedule: When changes in the construction schedule are necessary, these changes must be coordinated with the testing laboratory.
3. Adherence to Schedule: When the testing laboratory is ready to test according to the established schedule but is prevented from testing or taking specimens due to incompleteness of work, all extra charges for testing attributed to the delay shall be borne by the CONTRACTOR.

END OF SECTION

Section 01610 – Delivery, Storage and Handling

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Products to be used in the work shall be properly stored and handled as described in this section. This section is not intended as a substitution for good judgment by the CONTRACTOR, nor is it intended to limit protective measures to be taken by the CONTRACTOR during construction.

1.2 QUALITY ASSURANCE

1. General: The CONTRACTOR shall take the necessary measures to protect the materials and work as required.

1.3 MANUFACTURER'S RECOMMENDATIONS

1. General: Unless otherwise approved by the ENGINEER or specified herein, the CONTRACTOR shall comply with the manufacturer's recommendations on product handling, storage and protection.

1.4 PACKAGING

1. General: Products shall be delivered to the job site in their manufacturer's original container with labels intact and legible. Damaged materials shall be immediately replaced at no additional cost to the OWNER. The ENGINEER may reject, as non-complying, any materials that do not bear the proper identification such as manufacturer, grade, quality and other pertinent information.

1.5 PROTECTION OF SURFACES

1. General: The CONTRACTOR shall protect and maintain all finished surfaces from damage during storage and construction. Finished surfaces shall remain clean, unmarred and suitably protected until the work is accepted by the OWNER.

1.6 REPAIRS AND REPLACEMENTS

1. General: In the event of damage, the CONTRACTOR shall make the necessary replacements as approved by the ENGINEER at no additional cost to the OWNER. No extension of contract time will be given for work associated with replacement of damaged materials.

1.7 DELIVERY AND STORAGE

1. Delivery: The CONTRACTOR shall be responsible for making all the arrangements for the delivery, unloading, receiving and storage of materials.
2. Storage: The CONTRACTOR shall store all products and materials in a protected location to prevent any damage or deterioration due to moisture, freezing temperatures or other detrimental conditions.

3. Damaged or Rejected Material: Any damaged or rejected material shall be removed from the job site immediately.

END OF SECTION

Section 02080 – Utility Pipe and Materials

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: The work in this section shall include the furnishing, installation, and testing of all pipe, fitting and structures, and furnishing the equipment, labor and appurtenances for the installation of piped utilities. All work shall be completed as shown on the plans and as specified in related sections and hereunder.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01330 – Submittal Procedure
 - 2) Section 01610 – Delivery, Storage and Handling
 - 3) Section 02085 – Valves and Cocks
 - 4) Section 02317 – Excavating, Trenching and Backfilling for Utilities
 - 5) Section 02510 – Water Distribution

1.2 REFERENCES

1. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.
2. American Society for Testing and Materials (ASTM):
 - 1) A536 Standard Specification for Ductile Iron Castings
 - 2) B88 Standard Specification for Seamless Copper Water Tube
 - 3) C 76 Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
 - 4) C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
 - 5) D1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
 - 6) D2665 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
 - 7) D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
 - 8) D5926 Standard Specification for Poly (Vinyl Chloride) (PVC) Gaskets for Drain, Waste and Vent (DWV) Sewer, Sanitary and Storm Plumbing Systems
 - 9) F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
3. American National Standard Institute (ANSI)/American Water Works Association (AWWA):
 - 10) C105 Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
 - 11) C110 Standard for Ductile-Iron and Gray-Iron Fittings
 - 12) C111 Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

- 13) C151 Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water
 - 14) C153 Standard for Ductile-Iron Compact Fittings, 3 in. through 24 in. (76 mm through 610 mm) and 52 in. through 64 in. (1,400 mm through 1,600 mm) for Water Service
 - 15) C600 Standard for Installation of Ductile-Iron Water Mains and their Appurtenances
4. Virginia Department of Transportation – Road and Bridge Specifications (VDOT):
16) 232 Pipe and Pipe Arches

1.3 QUALITY ASSURANCE

- 1. Quality Assurance: All pipe and fittings shall be new, free from defects or contamination and shall, whenever possible, be the standard product of a single manufacturer.
- 2. Manufacturer's Limitations: Products used in the work of this section shall be manufactured in the U.S. where possible by manufacturers regularly engaged in production of similar items.

1.4 SUBMITTALS

- 1. General: Submittals shall be in accordance with Section 01330 – Submittal Procedures.

1.5 DELIVERY, STORAGE AND HANDLING

- 1. General: Delivery, storage and handling shall be in accordance with Section 01610 – Delivery, Storage and Handling.

PART 2 – PRODUCTS

- 1. General: Whenever proprietary equipment is specified, "or approved equal" is implied. All proposals for substitution shall be submitted in writing to the City of Winchester Department of Public Services for their approval.

2.1 PIPE

- 1. Reinforced Concrete Pipe (RCP): Reinforced concrete pipe shall be Class III, ASTM C76 and shall conform to the requirements of VDOT, Section 232. Size shall be as indicated on the plans.
- 2. Ductile Iron Pipe: Ductile iron pipe shall be used for water lines 4 inches and larger in diameter. The ductile iron pipe shall conform to the requirement of AWWA Standard C 151. Pipe shall be Class 52 minimum with cement-mortar lining and a bituminous seal coating conforming to the requirements of AWWA C 105.

2.2 FITTINGS

- 1. Ductile Iron Fittings: All water pipe fittings shall be ductile iron conforming to AWWA C 110, C 111, and C 153. Fittings shall be cement-mortar lined and with

- a bituminous seal coat. Fittings shall be short body standard with mechanical joints for buried installation and flanged for interior and exterior exposed installations. All fittings shall have a pressure rating for 350 psi or greater. Mechanical joint restraint for ductile iron fittings shall be incorporated in the design of the retainer gland. The gland shall include a restraining mechanism which, when activated, imparts multiple wedging action against the pipe which increases its resistance as pressure increases. Glands shall be designed to allow flexibility of pipe joints after installation and backfill. Glands shall be manufactured of ductile iron, conforming to ASTM A536-80. Glands shall have U.L. listing through 24-inch in size and Factory Mutual approval through 12 inch. Retainer glands shall be used on each side of fittings where the watermain changes direction. Additional sets of retainer glands are required at pipe lengths above and below fittings as required. Retainer glands shall be Megalug Series 1100, Ford Meter Box Co. Series 1400, or approved equal.
2. Couplings: Flexible couplings for use in joining gravity pipe of differing materials and/or sizes shall be constructed of elastomeric polyvinyl chloride conforming to ASTM C443, C 1173, D 5926 and secured to the connecting pipes using stainless steel screw type band clamps. Flexible couplings shall be similar to Series 1056 as manufactured by Fernco, Inc., Series 156 as manufactured by Indiana Seal, Series MR as manufactured by Mission Rubber Company, or approved equal.

PART 3 – EXECUTION

3.1 EXCAVATION, BACKFILLING AND COMPACTION

1. General: Trench excavation shall be in accordance with Section 02317 – Excavation, Trenching and Backfilling for Utilities.

3.2 SEPARATION OF WATER AND SEWER LINES

1. Parallel Installation:
 - 1) Normal conditions – Water mains shall be separated at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge-to-edge.
 - 2) Unusual conditions – When local conditions prevent a horizontal separation of 10 feet, the water main may be laid closer to a sewer manhole provided that:
 - a) The bottom (invert) of the water main shall be at least 18 inches above the top (crown) of the sewer.
 - b) Where this vertical separation cannot be obtained, the sewer shall be constructed of PVC SDR 26 pipe, pressure tested in place to 30 psi without leakage prior to backfilling.
 - c) The sewer manhole shall be of watertight construction and tested in place.
2. Crossings:
 - 1) Normal conditions – Water mains crossing over sewers shall have a separation of at least 18 inches between the bottom of the water line and the top of the sewer.

- 2) Unusual conditions – When local conditions prevent a horizontal separation of 18 inches, the water main may be laid closer to a sewer manhole provided that:
 - a) Sewers passing over or under water mains shall be constructed of PVC SDR 26 pipe, pressure tested in place to 30 psi without leakage prior to backfilling.
 - b) Water lines passing under sewers shall, in addition, be protected by providing:
 - A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line.
 - Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline.
 - That the length of the water line be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer.
3. Intersections: No water pipe shall pass through or come in contact with any part of the sewer or sewer manhole.
4. Special Cases: In the event that existing utilities or field conditions make it impossible or impractical to meet the separation requirements, the CONTRACTOR shall notify the ENGINEER. The ENGINEER, after consultation with the OWNER, shall provide special instructions for construction within the area of conflict.

3.3 INSTALLATION OF PIPE AND FITTINGS

1. General: No valve, hydrant, or other appurtenance on existing water lines shall be opened or closed for any purpose by the CONTRACTOR. Any opening or closing of valves or hydrants whatsoever shall be by the OWNER of the utility only. The CONTRACTOR shall notify the OWNER of the utilities at least 24 hours prior to the need to open or close any appurtenance, except in emergencies, at which time the OWNER of the utilities shall be notified immediately.
2. Handling: Pipe shall be placed in the trench in such a manner as to prevent damage to pipe and protective coatings and linings. Under no circumstances shall pipe be dropped or dumped into the trench. As the temperature approaches or drops below freezing, extra care shall be used in handling pipe.
3. Cleaning: Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. Spigot and bell ends of pipe and gaskets shall be cleaned and lubricated according to manufacturer's instructions. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug.
4. Cutting: Pipe shall be cut in a neat and workmanlike manner without damage to the pipe. Unless otherwise authorized by the ENGINEER, cutting shall be done by means of approved type of mechanical cutters. Wheel cutters shall be used when practicable.
5. Direction of laying: All pipe shall be laid with bell ends facing in the direction of laying unless otherwise directed by the ENGINEER. Where pipe is laid on a grade of 10 percent or greater, or for gravity pipe systems, the laying shall start at bottom and shall proceed upward with the bell ends of pipe upgrade. Each

piece of pipe shall be laid true to line and grade. The bottom of the trench shall be smoothly graded and bell holes provided so that the trench bottom provides uniform support to the barrel of the pipe when in final position. Adjustments to line or grade shall be made by removing or adding granular material under the barrel. In no case shall wedges or blocks be used under the body of the pipe. The pipe shall be pushed fully "home" by hand, with a bar and block of wood to cushion the bell, or other methods for large diameter pipe.

6. Bedding:

- 1) Outside traffic areas (see City of Winchester Standard Detail WS-1): The pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance. From 12 inches above the pipe to the final grade, excavated trench material containing stones no greater than 3 inches in diameter may be used as backfill material, unless otherwise specified.
- 2) Within traffic areas (see City of Winchester Standard Detail WS-2): The pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance. When pipe is constructed within the road, street, driveway or parking lot, granular backfill (VDOT #21A) is required for the full depth of backfill. Backfill shall be placed in 6 inch layers and compacted by tamping. Granular backfill (VDOT Class 21A) is required for the full depth of backfill where the trench is outside of the pavement but the nearest trench wall is within 5 feet of the edge of pavement.

7. Deflection at Joints: Maximum deflection for water main and pressure pipe joints will be as follows:

Pipe Size	Allowable Deflection (in inches)								PVC- AWWA (Push-on)
	Ductile Iron (Push on) Lengths				Ductile Iron (Mechanical) Lengths				
	12'	16'	18'	20'	12'	16'	18'	20'	
4"	12	17	19	21	21	28	31	34	12
6"	12	17	19	21	18	24	27	30	4
8"	12	17	19	21	13	18	20	22	3
10"	12	17	19	21	13	18	20	22	2.5
12"	12	17	19	21	13	18	20	22	2
16"	7.5	10	11	12	9	12	13.5	15	-

Flexible pipe may be curved in the trench to the limits specified in "Allowable Deflection (in inches table above)." Do not deflect PVC pipes in joints. Joints must be secured laterally in ditch and deflection effected in the barrel of the pipe unless specific allowance by manufacturer is provided in the joint.

8. Installation of Fittings: Fittings shall be installed with the same care that mainline pipe is installed. Caps or plugs shall be braced to prevent blow off during testing. Use fittings and gaskets manufactured by the pipe manufacturer designed specifically for connection to, and repair of, the pipe being used. Installation of

- fittings and repairs to pipe must be in accordance with the manufacturer's procedures and recommendations.
9. Jointing:
- 1) Mechanical Joints: When installing mechanical joint (MJ) ductile iron pipe, the socket, spigot end and rubber gasket shall be thoroughly washed with soapy water to remove any grease or grit that might damage the gasket. In making up the joint, the gland for MJ pipe followed by the gasket, shall be placed over the plain end of the pipe and inserted into the socket. The gasket shall be pushed into position without excessive force and evenly seated in the socket of the pipe bell, and the gland for MJ pipe, then moved into position against the face of the rubber gasket.
 - 2) Flanged Joints: Where flanged joints are used, they shall be installed by skilled workmen in accordance with the best standard practice. Bolts shall be tightened so as to evenly distribute the joint stress and insure proper pipe alignment.
10. Setting of Valves: Valves shall be installed in accordance with manufacturer's instructions and shall be in accordance with Section 02085 – Valves and Cocks and as shown on the standard details.
11. Anchorage: Pressure pipe lines shall be protected against joint pulling or thrust damage by suitable anchors, braces or tie rods installed at direction changes as a result of fittings and all other critical points. Rods and clamps shall be galvanized or otherwise rustproof treated. Reaction backing shall be of the size indicated on the plans, in Standard Details WD-11 and WD-12 and shall bear on solid undisturbed earth. Where restrained joint pipe or fittings such as Field Lok 350, Super-Lock MEGALUG Series 1100 as manufactured by EBAA Iron, Inc., Uni-Flange Series 1400 as manufactured by the Ford Meter Box Co., Inc. or approved equal, joint is used, bracing and anchorage will not be required.

3.4 PIPELINE TESTING

1. General: Testing of water lines and structures shall be at the CONTRACTOR's expense. Any defects or leaks shall be repaired or replaced at the CONTRACTOR's expense. Water for the first test shall be provided by the OWNER. Subsequent water for tests shall be at the CONTRACTOR's expense.
2. Pressure Testing:
 - 1) Test Section: Pressure and leakage testing shall be conducted on each valved section (between adjacent valves) of pressure pipeline.
 - 2) Procedures: Pressurization, air removal, and allowances shall be in accordance with AWWA C 600 and the Virginia Department of Health. Testing shall begin on the line within 30 days after the completed water main has been charged (filled). After the pipe has been laid, all pipe shall be subjected to a hydrostatic pressure of not less than 150 psi or 1.25 times the working pressure at the highest point along the test section. Each section of pipe to be tested shall be slowly filled with water. Expel all air from pipeline. Apply 100 percent of required test pressure before conducting the leakage test. Maintain test pressure for a minimum of 2 hours. There shall be zero leakage during the test period. If the leakage is greater or the pressure cannot be maintained, the contractor shall locate and make approved repairs

as necessary until the leakage is within the specified tolerance. All visible leaks are to be repaired, regardless of the amount of leakage.

- 3) Test Pressures: Test pressure shall be 150 psi unless otherwise noted. For test pressures less than 200 psi, CONTRACTOR shall demonstrate that there is no significant pressure (other than static) in the adjacent sections of pipeline to the one being tested.
- 4) Leakage: Leakage is defined as the amount of water that must be supplied into the newly laid pipe to maintain the test pressure, after the pipe has been filled with water and the air has been expelled. There should be no leakage during the test.

3.5 DISINFECTION

1. General: Disinfection of water mains shall be in accordance with Section 02510 – Water Distribution.

END OF SECTION

Section 02085 – Valves and Cocks

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Provide complete, in place, and free from leakage, all valves as shown on the plans and in accordance with this Specification. Valves shall be furnished complete with valve operators and accessories necessary for a complete assembly adequate for the specified or indicated purpose. Valves assemblies shall be installed, painted, tested and adjusted.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01330 – Submittal Procedure
 - 2) Section 01610 – Delivery, Storage and Handling
 - 3) Section 02080 – Utility Pipe and Materials

1.2 REFERENCES

1. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.
2. American National Standard Institute (ANSI)/American Water Works Association (AWWA):
 - 1) C515 Reduced Wall, Resilient-Seated Gate Valves for Water Supply Service
 - 2) C800 Standard for Underground Service Line Valves and Fittings

1.3 SYSTEM DESCRIPTION

1. General: Valves shall be non-rising stem, with handwheel, lever, nut, or hydraulic operator, as shown on the plans and specified herein.

1.4 SUBMITTALS

1. General: Submittals shall be in accordance with Section 01330 – Submittal Procedures. Each submittal shall be identified with precise use, line and location.
2. Shop Drawings: As a minimum, shop plans shall include manufacturers names, class of materials, catalog, and engineering data showing compliance with the specified requirements.
3. Maintenance Instructions: Submit corrective and preventative maintenance instructions, including recommended spare parts.

1.5 DELIVERY, STORAGE AND HANDLING

1. General: Delivery, storage and handling shall be in accordance with Section 01610 – Delivery, Storage and Handling.
2. Delivery: Deliver valves to the job site packaged, tagged and marked.
3. Storage: Store valves at the job site in a manner to prevent damage and accumulation of dirt and rust.

PART 2 – PRODUCTS

2.1 GATE VALVES

1. Direct Bury Gate Valves

- 1) Gate valves 12 inches and smaller shall be of the tight-closing resilient seated gate valves, which meet or exceed the requirements for AWWA C515.
- 2) All resilient seat valves are to be ductile iron body, internally reinforced molded natural rubber mounted, wedged disc, non-rising stem, tapered seat type.
- 3) Valves shall have a clear, unobstructed water way when fully opened and shall be at least as large as the pipe inside diameter for which it is intended.
- 4) Valves shall open counterclockwise and seating shall use compression closure.
- 5) Valve end connections shall be mechanical joint.
- 6) Valve end connections shall be 2-inch square operating nut.
- 7) The operating stem shall be a minimum diameter of 7/8-inch with a triple O-ring seal. The configuration of the O-rings shall be two above and one below the thrust collar.
- 8) Valves must have a 250 psi working pressure and 400 psi test pressure.
- 9) Valves installed with more than 5 feet of cover shall have extension rods added to bring the operating nuts to within 3 feet of the surface.
- 10) Manufacturer shall be Mueller Company (Model 2360), American Flow Control (Series 500 Resilient Wedge Valve) or approved equal.

2. Exposed Gate Valves

- 1) Valves shall meet requirements for direct bury valves with the following exceptions:
 - a) Joints shall be flanged
 - b) Valve shall be rising stem
 - c) Valve will be manually opened using a handwheel
 - d) Outside screw and yoke (OS&Y) type

3. Tapping Sleeve and Tapping Valve

- 1) Tapping sleeves shall be ductile iron construction meeting ASTM Grade 65-45-12. Side flange seals shall be of the O-ring type. Sleeves shall be coated with asphaltic varnish in compliance with NSF-61.
- 2) Tapping sleeves shall be American Flow Control Series 2500, 2800, or approved equal.
- 3) Tapping valves shall be resilient seat type with bodies and bonnets made of ductile iron for 250 psi working pressure. Cutter used shall be at least ¼-inch smaller than the valve size.
- 4) Tapping sleeves shall be American Flow Control Series 2500, or approved equal.

2.2 MISCELLANEOUS VALVES

1. Corporation Stop: Shall be ¾ inch unless otherwise indicated with inlet threads conforming to ANSI/AWWA C800, commonly known as the "Mueller" thread, and

an outlet compatible with the service pipe and shall be Mueller #H-15000 for copper outlet or approved equal.

2. Supply Stop Valves: Stop valves shall be angle type polished chrome plated shut-off stops with inlet end threaded and outlet compression fitting to match fixture fittings.

2.3 RELATED ITEMS

1. Valve Boxes: Valve boxes are to be installed on all valves within the water network. These boxes shall be two piece and screw type for adjustment to finish grade. Valve box shall be furnished with a 5-1/4 inch lid made of cast iron and marked "Water." When valve may be subjected to traffic, the top of the valve box shall be flush with the final surface. An 18"x18" concrete pad (6" thick) is required around valve boxes installed outside of pavement area.
2. Valve Operators: Shall be either handwheel or wrench for nut operated valves as indicated on the plans. Minimum two wrenches shall be provided by the manufacturer of nut operated valves.

PART 3 – EXECUTION

3.1 INSPECTION

1. General: Examine the areas and conditions under which work of the Section will be performed. Correct conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION – ALL VALVES

1. General: Valve installation shall comply with Standard Details and the Manufacturer's recommendations.
2. Stems: Shall be oriented for accessibility as approved by the OWNER's representative. Do not install valves with stems in the downward direction.
3. Setting of Valves: A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished grade or as directed by the ENGINEER. Valve boxes shall be installed in accordance with the Standard Detail WD-9.
4. Transmitting Forces: Valves and valve boxes shall be installed so no forces are transmitted to the valve through the piping or valve boxes.
5. Cleaning: All valve and appurtenances shall be flushed clear of all foreign material after installation.
6. Testing: Field test all valves and appurtenances for proper operation, proper adjustments and settings, freedom from vibration, binding, scrapings, and other defects. Check all valve supports for strength and high quality workmanship. All defects shall be corrected to the satisfaction of the OWNER's representative. Hydrostatic and leakage tests shall be in accordance with Section 02080 – Utility Pipe and Materials.

END OF SECTION

Section 02300 – Earthwork

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Excavate and grade in the areas designated in the Contract Documents as shown on the grading plan and specified herein, which shall include but not be limited to, the following:
 - 1) Excavation and site preparation
 - 2) Grading to establish subgrades for slabs, walks, pavements, gravel surfaces, and grassed areas
 - 3) Excavation, filling and backfilling and compaction
 - 4) Dewatering or addition of water as required
 - 5) Placing of topsoil and finish grading
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01330 – Submittal Procedures
 - 2) Section 02317 – Excavation, Backfilling and Compacting for Utilities

1.2 REFERENCES

1. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.
2. American Society for Testing and Materials (ASTM):
 - 1) D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
 - 2) D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
 - 3) D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³)
 - 4) D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 - 5) D2487 Standard Classification of Soils for Engineering Purposes (unified Soils Classification System)
 - 6) D2922 Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - 7) D2937 Standard Test Methods for Density of Soil in Place by the Drive-Cylinder Methods
 - 8) D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
 - 9) D4318 Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
3. Virginia Department of Transportation – Road and Bridge Specifications (VDOT):
 - 1) 303 Earthwork

1.3 DEFINITIONS

1. Controlled Fill: Controlled fill is required in all areas.
2. Unclassified Excavation: For the purposes of payment, material shall not be classified regardless of the type of material encountered.
3. Satisfactory Materials: Materials classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML and CL are satisfactory as fill for overlot grading and are satisfactory in-situ. Materials shall have a minimum compacted density of 95 pounds per cubic foot and a plasticity index in excess of 15.
4. Unsatisfactory Materials: Materials classified by ASTM D 2487 as OL, OH, MH, CH and PT are unsatisfactory in-situ and as fill. Unsatisfactory materials also include those materials containing roots and other organic matter, trash, debris, frozen materials, and stones larger than 4 inches. Fill materials containing stones larger than 4 inches shall not be used in the uppermost 2 feet.
5. Cohesionless and Cohesive Materials: Cohesive materials include materials classified as GC, SC, ML, CL, MH and CH. Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, GW and SP. Materials classified as GM and SM will be identified as cohesionless only when the minus #40 fraction has a plasticity index of zero as classified by ASTM D 4318.
6. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 698 or ASTM D 1557 as specified, abbreviated above as a percent of laboratory maximum density.
7. Topsoil: Material obtained from excavations, suitable for topsoils, shall consist of friable clay loam, free from roots, stones and other undesirable material and shall be capable of supporting a good growth of grass.
8. Geotechnical Engineer: A representative of a commercial geotechnical testing laboratory which will be used by the CONTRACTOR to provide the required quality assurance testing.
9. Undercut Excavation: Undercut excavation shall consist of removing and disposing of unsuitable material located within the construction limits in accordance with VDOT Section 303.06(a)3.

1.4 SYSTEM DESCRIPTION

1. Soil Bearing Capacity: Soil underneath all footings and structures shall have a minimum bearing capacity of 2000 pounds per square foot.

1.5.1 SUBMITTALS

1. General: Submittals shall be in accordance with Section 01330 – Submittal Procedures. Copies of all test results and field and office worksheets shall be furnished to the ENGINEER within 48 hours after the tests are complete.
2. Test Reports: The testing agency shall submit the following reports, in duplicate, directly to the OWNER from the testing services, with copy to the CONTRACTOR.
 - 1) Test report on borrow material for soil classification.
 - 2) Field density reports and map of test locations.
 - 3) One optimum moisture-maximum density curve for each type of soil used for controlled fill.

- 4) Other reports of any testing hereinafter specified deemed necessary by Soils Engineer or requested by the OWNER.
- 5) A test location plan shall be included with each submittal.

1.6 QUALITY ASSURANCE

1. Geotechnical Engineer: The CONTRACTOR shall retain a licensed independent Geotechnical Engineer and Test Laboratory approved by the OWNER to insure that earthwork meets the requirements of the specifications for density and moisture content.
2. Inclement Weather: When fill operations are ceased due to weather (rain, freezing, snow, etc.), construction shall not be resumed until the Geotechnical Engineer has verified soil strength has not been adversely affected. If soil strength has been decreased, the affected portion of fill shall be rescarified, moistened, or dried as required and recompact to the specified density.
3. Inspection: The CONTRACTOR's Geotechnical Engineer shall conduct inspections as necessary to verify that the specifications are being met for the installation of materials.
4. Coordination: The CONTRACTOR shall coordinate the work with the OWNER's Resident Project Representative by notifying the Resident Project Representative of scheduled work in advance. The CONTRACTOR shall coordinate work with other trades whose work will be affected on the site.
5. Utilities: Prior to any excavation the CONTRACTOR shall verify the locations of all utilities which may be in the area.
6. Drainage: The CONTRACTOR shall be responsible for the proper drainage of the site during construction of the project. Water shall not be allowed to accumulate in any of the excavated areas. Storm or ground water collecting on site during construction shall be removed by pumping, ditching or other suitable means.

1.7 PROJECT CONDITIONS

1. Existing Utilities: Located existing underground utilities in area of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 1) Should uncharted, incorrectly charted, unmarked in field, or incorrectly marked in the field piping or other utilities be encountered during excavation, CONTRACTOR shall consult utility owner immediately for directions. CONTRACTOR shall cooperate with OWNER and utility companies in keeping respective services and facilities in operation, and shall repair or arrange for repair of existing utilities to the satisfaction of the OWNER.
2. Blasting: Blasting will not be allowed.
3. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
 - 1) The CONTRACTOR shall operate warning lights as recommended by authorities having jurisdiction.
 - 2) The CONTRACTOR shall protect structures, utilities, sidewalks, pavements, trees and other facilities from damage caused by settlement,

lateral movement, undermining, washout and other hazards created by earthwork operations.

- 3) The CONTRACTOR shall protect, maintain and restore bench marks, monuments, and other reference points affected by this work. If bench marks, monuments or other permanent reference points are displaced or destroyed, points shall be re-established and markers reset under supervision of a licensed Land Surveyor.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Materials: All fill materials shall be free from mud, refuse, construction debris, organic material, rock or gravel greater than 4 inches in any dimension, frozen or otherwise unsuitable material. Materials for fills shall be secured from excavation after rejection of any unsuitable materials. Materials from other sources may be used upon approval by the Geotechnical Engineer. Fill materials in the uppermost 2 feet shall not have any rocks larger than 4 inches in diameter.
2. Borrow: Material for use in replacing undercut areas or in construction of embankments shall be approved by the Geotechnical Engineer and obtained from approved sources.
3. Rock: Rock shall be removed to a minimum depth of 12 inches below the subgrade elevation. The excavated area shall be brought up to subgrade with approved material placed and compacted as described herein. Other applicable specifications are listed in VDOT 303 concerning undercutting rock.
4. Unsuitable Materials: Areas that exhibit excessive pumping or that do not meet density requirements due to unsuitable material as determined by the Geotechnical Engineer shall be undercut and replaced with approved material in accordance with PART 3 – EXECUTION.

PART 3 - EXECUTION

3.1 TOPSOIL

1. Conservation of Topsoil: Topsoil shall be removed as required without contamination with subsoil and stockpiled convenient to areas for later application or at locations specified. Any surplus of topsoil from excavations and grading shall be stockpiled in a located approved by the OWNER. A silt fence shall be installed on the downslope side and the stockpiles seeded.
2. Placing Topsoil: On areas to receive topsoil, the compacted subgrade shall be scarified to a 2-inch depth for bonding of topsoil with subsoil. Topsoil shall be spread evenly and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry.

3.2 EXCAVATION

1. Excavation: Excavation shall be unclassified. After topsoil removal has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. All unsuitable material including any soil

- which is disturbed by the CONTRACTOR's operations and surplus material shall be disposed of at locations off site secured by the CONTRACTOR and approved by the OWNER. Excavations carried below the depths indicated, shall, except as otherwise specified, be refilled to the proper grade with satisfactory material as directed. All additional work of this nature shall be at the CONTRACTOR's expense. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Excavations shall be kept free from water while construction therein is in progress. If the CONTRACTOR fails to provide adequate drainage and any material becomes soft or otherwise unsuitable as a result, such material shall be removed and replaced with satisfactory on-site material or borrow material from approved sources, or shall be dried and recompacted as directed by the Geotechnical Engineer at no additional cost to the OWNER. Fill areas and slopes may be adjusted to balance earthwork quantities as approved by the ENGINEER. Material required for fills in excess of that produced by excavation within the grading limit shall be obtained from borrow areas at the CONTRACTOR's expense.
2. Excavation for Utilities: Trenches for underground utility systems and drain lines shall be in accordance with Section 02317 – Excavation, Trenching and Backfilling for Utilities.
 3. Ditches, Gutters and Channel Changes: Ditches, gutter and channel changes shall be cut accurately to the cross sections and grades indicated. All roots, stumps, rock and foreign matter in the sides and bottom of ditches, gutter and channel changes shall be trimmed and dressed or removed to conform to the slope, grade and shape of the section indicated. Care shall be taken not to excavate ditches and gutters below the grades indicated. Excessive ditch and gutter excavation shall be backfilled to grade either with compacted to specified densities material or with suitable stone or cobble to form and adequate gutter paving as directed. All ditches and gutters excavated under this section shall be maintained until final acceptance of the work. Satisfactory material excavated from ditches and channel changes shall be placed in fill areas. Unsuitable and excess material shall be disposed of in designated waste areas or as directed.
 4. Unauthorized Excavation:
 - 1) Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the ENGINEER or the Geotechnical Engineer.
 - 2) Under footings or foundations, fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the unauthorized excavation bottom, but in no way altering the required top elevation.
 - 3) Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Geotechnical Engineer.
 5. Stability of Excavations: Maintain sides and slopes of excavations in a manner such that the excavation provides safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
 6. Undercut Excavation: When unsuitable material must be removed from an area of the project where undercut is not shown on the plans, unsuitable material removed after reaching the depth specified herein or 1 foot below original ground in fill sections where topsoil and root mat are not required to be removed, will be measured as undercut excavation.

3.3 FILL

1. Preparation of Ground Surface for Fill: All vegetation such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetative matter, rubbish, and other unsatisfactory material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsatisfactory material remain in or under the fill area. The areas shall then be scarified to a depth of at least 6 inches, moistened or aerated as required and compacted with vibratory rollers, pneumatic rollers, sheepfoot rollers or other mechanical means acceptable to the Geotechnical Engineer. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, benched or broken up, as directed, in such a manner that the fill material will bond with the existing surface. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be required to obtain the specified moisture content and density.
2. Fills and Embankments: Fills and embankments shall be constructed at the locations and to the lines and grades indicated. The completed fill shall conform to the grading plan indicated. Approved material obtained during excavation may be used in forming required fill. Fill shall be satisfactory material and shall be free from roots or other organic material. No frozen material will be permitted in the fill. Stones having a dimension greater than 4 inches shall not be permitted in the upper 2 feet of fill or horizontal embankment. The material shall be placed in successive horizontal layers of 8 inches in loose depth for the full width of the cross section and shall be compacted as specified. Each layer shall be compacted before the overlaying lift is placed. Moisture content of the fill or backfill material shall be adjusted by wetting or aerating as necessary to provide the moisture content specified.

3.4 COMPACTION

1. Subgrade Compaction: The cut subgrade material shall be compacted to 95 percent of its maximum dry density as determined by ASTM D 698. The moisture content should be within +/- 3 percentage points of the material's optimum as determined by ASTM D 2216.
2. Compaction: Each layer of the fill shall be compacted to at least 95 percent of the maximum theoretical density as determined by ASTM D 698. Moisture content shall be within +/- 3 percent of optimum as determined by ASTM D 2216.

3.5 FINISHED GRADES

1. General: All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified. Ditches and gutter shall be finished to permit adequate drainage.
2. Unsatisfactory Material: Soft or otherwise unsatisfactory material shall be replaced with satisfactory excavated material or other approved materials.
3. Finished Elevations: Low areas resulting from removal of unsuitable material or from excavation of rock shall be brought up to required grade with satisfactory materials, and the entire area shall be shaped to line, grade and cross section

and shall be compacted as specified. The surface of embankments or excavated areas for road construction or other areas on which a base course of pavement is to be placed shall vary not more than 0.10 feet from the established grade and approved cross-section. Surfaces other than those to be paved shall be finished not more than 0.20 feet above or below the established grade or approved cross-section.

3.6 PROTECTION

1. Site Preservation: The CONTRACTOR shall protect newly graded areas from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the Erosion Control provisions of these specifications.

3.7 FIELD QUALITY CONTROL

1. Testing: Testing shall be the responsibility of the CONTRACTOR at no additional cost to the OWNER, and shall be performed by an approved independent testing laboratory qualified to perform such tests and approved by the ENGINEER. Standard Proctor tests conforming to ASTM D 698 shall be made by the Geotechnical Engineer or his representative on each soil type found in the areas prepared to receive fill and in the soil to be used for fill. Field Density tests shall be made by the Geotechnical Engineer or his representative in accordance with ASTM D 1556 or ASTM D 2922 and ASTM D 3017 on the areas prepared to receive fill and on each layer of compacted fill. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D 2922, paragraph "ADJUSTING CALIBRATION CURVE." ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture gauges along with density calibration checks as described in ASTM D 3017. ASTM D 2937 shall be used only for soft, fine-grained, cohesive soils. At least one test shall be performed on the compacted backfill. More tests shall be performed if in the judgment of the Resident Project Representative, Geotechnical Engineer, or ENGINEER the compactive effort of the CONTRACTOR will not result in the specified density.
2. Visual Inspection: Upon completion of all excavation of unsuitable material, and for all footings, the Geotechnical Engineer shall visually inspect the subgrade and excavations. The visual inspection shall be conducted to assure that the data obtained from the test borings and used as a basis of design was representative of the site conditions. Upon completion of the inspection, the Geotechnical Engineer shall provide written notification to the OWNER/ENGINEER.

END OF SECTION

Section 02317 – Excavation, Trenching and Backfilling for Utilities

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Excavation and preparation of trenches as shown on the plans and specified herein, backfilling and site restoration.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01110 – Summary of the Work
 - 2) Section 02080 – Utility Pipe and Materials
 - 3) Section 02700 – Pavement Structure

1.2 REFERENCES

1. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.
2. American Society for Testing and Materials (ASTM):
 - 1) D698 Test Method for Laboratory Compaction Characteristics of Soils Using Standard Effort (12,400 ft-lbf/ft³)
 - 2) D1556 Standard Test Method for Density and Unit Weight of Soil In Place by the Sand-Cone Method
 - 3) D1557 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³)
 - 4) D2167 Standard Test Method for Density and Unit Weight of Soil In Place by the Rubber Balloon Method
 - 5) D2487 Standard Classification of Soils for Engineering Purposes (unified Soils Classification System)

1.3 DEFINITIONS

1. Controlled Fill: Controlled fill is required beneath all areas on which final grade is not placed on original excavated soil.
2. Classified Excavation: For the purposes of payment, material shall not be classified.
3. Satisfactory Materials: Materials classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML and CL are satisfactory as fill for overlot grading and are satisfactory in-situ.
4. Unsatisfactory Materials: Materials classified by ASTM D 2487 as OL, OH, MH, CH and PT are unsatisfactory in-situ and as fill. Unsatisfactory materials also include those materials containing roots and other organic matter, trash, debris, frozen materials, and stones larger than 6 inches. Unsatisfactory materials also include man-made fills, refuse, or backfills from previous construction.
5. Cohesionless and Cohesive Materials: Cohesive materials include materials classified as GC, SC, ML, CL, MH and CH. Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, GW and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have plasticity index of zero.

6. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 698 or ASTM D 1557 as specified, abbreviated above as a percent of laboratory maximum density.
7. Topsoil: Material obtained from excavations, suitable for topsoils, shall consist of friable clay loam, free from roots, stones and other undesirable material and shall be capable of supporting a good growth of grass.
8. Rock: Rock shall consist of boulders measuring $\frac{1}{2}$ cubic yard or more and materials that cannot be removed without systematic drilling and blasting such as rock material in ledges, bedded deposits, unstratified masses and conglomerate deposits, and below ground concrete or masonry structures, exceeding $\frac{1}{2}$ cubic yard in volume.
9. Unyielding Material: Unyielding material shall consist of rock and gravelly soils with stones greater than 18 inches in any dimension.
10. Unstable Material: Unstable material shall consist of materials too wet to properly support the utility pipe, conduit or appurtenance structure.
11. Select Granular Material: Select granular material shall consist of well-graded sand, gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall not contain more than 10 percent by weight of material passing a No. 200 mesh sieve. The maximum allowable aggregate size shall be 1 inch or the maximum size recommended by the pipe manufacturer, whichever is smaller.
12. Initial Backfill Material: Initial backfill material shall consist of select granular material or satisfactory materials free from rocks 1 inch or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller.

1.4 QUALITY ASSURANCE

1. Testing Results: Copies of all laboratory and field test reports shall be submitted to the ENGINEER within 48 hours of the completion of the test.

PART 2 - EXECUTION

2.1 GENERAL

1. Classification: Excavation and material shall be unclassified for purposes of payment. No extra payment will be considered for any excavation regardless of the type of material encountered including rock.

2.2 CLEARING

1. General: Only that portion of the work area actually needed for construction shall be cleared unless directed otherwise by the ENGINEER. In no case shall clearing or debris from clearing operations be taken past the rights-of-way lines or designated work areas. Areas disturbed by construction operations shall be protected from erosion by suitable methods outlined in the Virginia Erosion and Sediment Control Handbook.

2.3 EXCAVATION AND PREPARATION OF TRENCH

1. Depth: Depth of trenches shall be as shown on plans and cut sheets except that the trench shall be excavated to allow for a depth of $\frac{1}{4}$ of the pipe's outside diameter or a minimum of 4 inches of bedding in earth and 6 inches of aggregate bedding in rock for gravity sewer.
2. Width: Width shall be sufficient to allow pipe installation without walking or standing on pipe. The trench width at a point 12 inches above the top of the pipe shall not be less than 6 inches and not more than 12 inches on each side of the pipe's largest diameter unless otherwise directed by the ENGINEER.
3. Unsuitable Material: Wet or otherwise unsuitable soil at the subgrade shall be removed and replaced with approved sound materials at no cost to the OWNER. Excess or unsuitable materials shall be disposed of by the CONTRACTOR.
4. Rock Excavation: Ledge rock, boulders and large stones shall be removed to provide a clearance of at least 6 inches below and on each side of all pipe, manholes, valves or other appurtenances and overdepth shall be backfilled with satisfactory material and compacted in conformance with BACKFILLING subsection.
5. Topsoil: Topsoil shall be stripped from excavation area and stockpiled in approved area until needed for finish backfill and grading.
6. Trench Protection: The CONTRACTOR shall furnish and erect such sheathing, bracing and shoring, and shall furnish necessary signs, barricades and temporary lighting as may be pertinent for the protection of work, employees, the public, adjacent structures, and to guard against contingencies which might give rise to delays in the work. Sheathing left in place shall be at the CONTRACTOR's expense. Where trench wall sloping is necessary for safety or other reasons, the ENGINEER shall be notified to determine if additional strength pipe will be required. Responsibility for preservation of trench banks and other excavated spaces and the prevention of injury to any persons or property shall rest entirely with the CONTRACTOR. A maximum of 200 feet of trench will be allowed open at any time. Trench construction and safety shall be governed by the Occupational Safety and Health Standards for the Construction Industry, Subpart P.
7. Pumping, Bailing and Draining: The CONTRACTOR shall remove any water which may accumulate or be found in the trenches or other excavations and shall keep the excavations clear of water while work is being installed, unless approval to the contrary is granted by the ENGINEER.
8. Blasting: Blasting will not be allowed.
9. Cleated Equipment: No cleated equipment shall be used on pavements. Road drainage shall not be clogged, and shoulders, ditches, roadside drainage facilities and pavement affected by trenching operations shall be maintained in a satisfactory condition. Entrances shall not be blocked except for short periods as arranged with the property owner, and ingress and egress to adjacent property shall be maintained at all times.

2.4 WORK WITHIN ROAD RIGHTS-OF-WAY

1. Traffic Control: Typical traffic control for utility work on road rights-of-way shall comply with VDOT Work Area Protection Manual traffic control details and the Maintenance of Traffic plan.
2. Traffic Routing: Traffic shall not be blocked or re-routed without permission from the OWNER. Where one way traffic is permitted to be maintained, it shall be

- flagged 24 hours per day. Traffic shall at all times be properly protected by adequate lights, barricades and signs, and also flagmen when needed.
3. Erosion and Sediment Control: At all locations silt fence, sediment traps, brush barriers or other measures are to be utilized in prevention of erosion and siltation.
 4. Trenches: No trench within street rights-of-way can remain open overnight.
 5. Roadway Crossings: Where required, existing pavement may be cut, using saw cuts only. After the excavated section has been backfilled and immediately prior to repaving, an additional 12 inches of pavement shall be removed from each side of the trench so that an undisturbed shoulder will be provided under the new work (see detail WS-2). Sidewalks or curb and gutter disturbed by construction shall be removed and replaced at existing joints. Cutting shall be done neatly so that a uniform, straight joint will result to provide a bond with the original concrete or pavement. In street rights-of-way, cutting of pavement or open cutting ditches for utility installation shall be approved by the City.

2.5 WASTE AREAS

1. General: Disposal of unsuitable and surplus material at designated waste areas shall be carried out in accordance with Section 01110 – Summary of the Work.

2.6 COORDINATION

1. General: The CONTRACTOR shall notify the property owner in advance of commencing work and in the event of the necessity of disrupting utility or other services to such property, he shall notify the OWNER or responsible person in charge of such utility or other services and arrange for the disruption and restoration of such service in a manner which will result in a minimum of inconvenience to parties concerned.

2.7 BACKFILLING

1. Materials: All backfill materials shall be free from mud, refuse, construction debris, organic material, boulders, frozen or otherwise unsuitable material. Initial backfill shall be as defined in this section. Remaining backfill may contain stones up to 5 inches in their greatest dimension, unless otherwise specified. The CONTRACTOR may backfill with the excavated material, provided it meets the conditions as stated above.
2. Storm Sewer Bedding: Bedding shall be required on all gravity sewer lines, and shall be in accordance with City of Winchester Standard Detail WS-2. Bedding material shall extend from the excavated trench bottom to the pipe springline (midpoint). Bedding material shall be compacted to 95 percent of maximum density as measured by ASTM D 698.
3. Pressure Pipe Bedding: Bedding for pressure pipe shall be in accordance with City of Winchester Standard Detail WS-2. Bedding material shall extend from the excavated trench bottom to the pipe springline (midpoint). Bedding material shall be compacted to 95 percent of maximum density as measured by ASTM D 698.
4. Backfilling to Grade:
 - 1) Within traffic areas (see City of Winchester Standard Detail WS-2): The pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the

pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance. When pipe is constructed within the road, street, driveway or parking lot, granular backfill (VDOT #21A) is required for the full depth of backfill. Backfill shall be placed in 6-inch layers and compacted by tamping. Select backfill (VDOT #21A) is required for the full depth of backfill where the trench is outside of the pavement by the nearest trench wall is within 5 feet of the edge of pavement.

5. Backfill Testing: The CONTRACTOR shall demonstrate the adequacy of backfill compaction by performing density testing of the completed trench in areas where depth of the trench is 3 feet or greater. Density testing shall be performed at three depths for each test location: surface, mid-depth, and near maximum trench depth. The character of the backfill material will be observed during the excavation for density testing to determine conformance with the specifications. Density testing shall be performed using nuclear field density equipment of conventional weight-volume methods. If the weight-volume method is used, volume shall be determined by using the sand replacement test (ASTM D 1556) or liquid displacement methods (ASTM D 2167). If nuclear methods are used, the trench correction effect shall be accounted for by recalibrating the nuclear gauge on its calibration block at the location of each test prior to taking the density measurement. The CONTRACTOR shall furnish all equipment, tools and labor to prepare the test site for testing. Testing shall be performed by an independent testing laboratory qualified to perform such tests and approved by the ENGINEER. All testing shall be witnessed by the Resident Project Representative. The test shall be repeated until satisfactory results are obtained. The CONTRACTOR is responsible for the costs of all retests.

- 1) Normal Testing Frequency: One test shall be performed within the first 500 feet of pipe installed by each crew. This test will be used as an initial evaluation of the compaction methods being used. Beyond the initial 500 feet, one test shall be performed per lift in each 1,000 foot section of pipe installed or fraction thereof. Testing shall progress per lift as each 1,000 foot section is completed. The location of the test within each section shall be selected by the Resident Project Representative. Testing which indicates that unacceptable material has been incorporated into the backfill or that insufficient compaction is being obtained shall be followed by expanded testing to determine the limits of the unacceptable fill.
- 2) Expanded Testing Requirements: If normal testing within a test section indicates unacceptable backfill, the ENGINEER or OWNER may require additional testing within the same test section to determine the limits of unacceptable backfill. Additional testing required by the Resident Project Representative shall not exceed testing of 4 additional locations within the test section. Unacceptable backfill within the limits established by the testing shall be removed and replaced by the CONTRACTOR at no additional cost to the OWNER. Additional testing beyond that required may be performed by the CONTRACTOR at his expense to further delineate limits of unacceptable backfill.
- 3) Additional Testing: Testing beyond the normal frequency or expanded testing required which is requested by the ENGINEER or OWNER, and approved by the OWNER, shall be at the OWNER's expense.

6. Finished Surfaces: Uniformly smooth grading of disturbed areas shall be required after backfill and compaction. Road surfaces shall have a minimum depth of 6 inches of VDOT BM-25.0 base asphalt for temporary pavement for the maintenance of traffic. Road surfaces shall be restored permanently according to the typical section shown in Sheet 2 of the plans. Ditches and gutter shall be finished to drain readily. In grass or lawn areas, the last 4 inches of compacted fill will consist of topsoil or an approved soil which will support a turf growth after fertilization and seeding. Settlement or other damage that occurs prior to acceptance of this work shall be repaired and grades satisfactorily reestablished.
7. Quality Assurance: The CONTRACTOR will be responsible for and shall repair any settlement in the backfill or pavement for a period of one year after completion of the work.

2.8 SITE RESTORATION

1. Replacement of Property: The CONTRACTOR shall restore all pavement, sidewalks, curbing, gutter, fences, poles, culverts, utilities or other such property and surface structures removed or disturbed as a part of the work to a condition equal to that before the work began.
2. Pavement Repair: Pavement shall be temporarily repaired with base course asphalt for maintenance of traffic. All temporary repairs shall be maintained in good condition by the CONTRACTOR until final paving is complete.
3. Drainage Improvements: The CONTRACTOR shall restore and/or repair all drainage ways and swales including paved or concrete channels as part of this work to a good condition equal to that before the work began. Damaged drainage facilities shall be replaced. Restored ditches and swales shall provide positive drainage from roadways. Drainage restoration within street rights-of-way shall be to the satisfaction of the City.
4. Cleanup: The CONTRACTOR shall at all times keep the site cleaned to the satisfaction of the Resident Project Representative. In all cases, he shall "broom" the surfaces of paved streets immediately following backfilling. All surplus materials shall be removed and disposed of from the site of the work unless directed otherwise by the ENGINEER. Where material is placed on pavement, a layer of stone dust or sand shall be applied first to facilitate cleanup.
5. Roadways/Driveways: For private entrances and driveways disturbed as part of the work, the CONTRACTOR shall restore the road surface by grading and providing adequate drainage, and with a finished layer of 6 inches of VDOT #21A stone aggregate and 1 ½ inches of SM-9.5A asphalt in the disturbed areas.

END OF SECTION

Section 02370 – Erosion and Sediment Control

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: The CONTRACTOR shall furnish all labor, materials, supplies and equipment necessary to provide erosion and sediment control during construction of the facilities. The CONTRACTOR shall be responsible for obtaining an approved land disturbance permit from the City of Winchester.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01330 – Submittal Procedures
 - 2) Section 01610 – Delivery, Storage, and Handling
 - 3) Section 02630 – Storm Drainage
 - 4) Section 02930 – Exterior Plants
 - 5) Section 02921 – Seeding

1.2 TEMPORARY MEASURES

1. General: Temporary erosion and sediment control shall be achieved by using the following measures where indicated on the plans or as required for erosion control: Straw bale barriers, temporary interceptor dikes, gravel outlet structures, and silt fence barrier. Said measures shall be constructed and made workable prior to beginning site excavation and grading work.

1.3 PERMANENT MEASURES

1. General: Permanent erosion and sediment control shall be achieved by seeding, landscaping, and drainage structures. The CONTRACTOR shall schedule excavation, fill, finish grading, and seeding work in such a manner as to minimize exposure to erosive forces. Seeding of exposed areas shall commence as soon as possible after excavating, backfilling, grading, or other operations have been completed and shall be maintained until an acceptable stand of turf has been developed. Slope protection shall be installed as soon as the grading is complete.

1.4 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
2. American Society of Testing and Materials (ASTM):
 - 1) D 448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction

3. Virginia Department of Conservation and Recreation Virginia Erosion and Sediment Control Handbook (VESCH):

- | | | |
|----|------|---------------------------------------|
| 1) | 3.02 | Construction Entrance |
| 2) | 3.03 | Construction Road Stabilization |
| 3) | 3.05 | Silt Fence |
| 4) | 3.19 | Riprap |
| 5) | 3.31 | Temporary Seeding |
| 6) | 3.32 | Permanent Seeding |
| 7) | 3.36 | Soil Stabilization Blankets & Matting |

4. Virginia Department of Transportation - Road and Bridge Specifications (VDOT):

- | | | |
|----|-----|--------|
| 1) | 414 | Riprap |
|----|-----|--------|

1.5 QUALITY ASSURANCE

1. General: All erosion control measures shall be in accordance with Virginia Erosion and Sediment Control Handbook (VESCH), and all revisions and addenda. Methods used on site shall include, but shall not be limited to; VESCH, Chapter 3.
2. Performance Requirements: The erosion control measures shall be installed such that the erosion of disturbed ground and the siltation of storm drain pipes and inlets will be prevented.
3. Regulatory Requirements: All phases of the construction work shall comply with or exceed the minimum state requirements for controlling erosion and sedimentation from "land disturbing activities" as outlined in the "Virginia Erosion and Sediment Control Handbook" (VESCH), and all revisions and addenda thereto.

1.6 MAINTENANCE

1. Maintenance Service: The erosion control measures shall be maintained by the CONTRACTOR until a vegetative groundcover is achieved, which in the opinion of the ENGINEER, is mature enough to control soil erosion and to survive severe weather conditions.

1.7 SUBMITTALS

1. General: Shall be in accordance with Section 01330 – Submittal Procedures.
2. Materials: The CONTRACTOR shall submit to the ENGINEER shop plans or catalog cuts for:
 - 1) Materials list of items proposed to be provided under this Section.
 - 2) Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.8 PRODUCT HANDLING

1. General: Shall be in accordance with Section 01610 - Delivery, Storage, and Handling.

1.9 SITE CONDITIONS

1. Environmental Requirements: Properties and natural waterways adjacent to the site of land disturbance shall be protected from sedimentation by the use of the erosion control measures shown on the plans and in compliance with pertinent erosion and sediment control practices.
2. Vegetation: When conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions or obstructions, the CONTRACTOR shall notify OWNER before planting.
3. Planting Time: Times shall be in accordance with VESCH 3.32 Permanent Seeding.

PART 2 MATERIALS

1. Silt Fencing: Silt fence barriers shall be constructed by setting 1 inch x 2 inches x 3 feet stakes and excavating a 4 inch x 4 inch trench along the line of stakes. Staple fencing to stakes and extend into trench. Backfill and compact excavated soil, anchoring silt fence.
2. Gravel Outlet Structures: Gravel outlet structures shall be constructed of ASTM D 448 #2 stone or its equivalent. The bases and side slopes of the gravel shall be placed so as to conform to the dike configuration. The invert of the outlet shall be not less than six inches lower than the top of the adjoining earth dike, and the gravel shall extend to the top of the dike. Discharge from the outlet structure shall be onto an already stabilized area or watercourse. The gravel outlet structure shall be inspected for silt accumulation after each runoff-producing rain. If structure ceases to function properly due to silt accumulation, the gravel shall be replaced.
3. Construction Entrance: Adequate stone shall be applied at entrances to the work area required or shown on the plans prior to and during construction to control dust, erosion, siltation and to maintain normal traffic. Stone used to construct the temporary construction entrance shall be ASTM D 448 #1 or #2 stone as shown on the plans.
6. Riprap: Riprap shall be a rubble stone riprap, 50 to 150 pounds each, similar to VDOT 414 Class I, unless shown otherwise on plans.
7. Soil Stabilization Mat: Mat shall be a degradable multi-layered soil stabilization blanket consisting of a netting of polyethylene, nylon, vinyl, or other material intertwined with a natural organic or manmade mulch, a jute mesh or excelsior mat specifically manufactured for maintaining soil slopes until vegetation becomes established. Soil stabilization mat shall be provided by a manufacturer from according to the plans.
8. Permanent Seeding: Seeding shall be in accordance with VESCH 3.32 Permanent Seeding.

PART 3 EXECUTION

3.1 PREPARATION

1. General: Work shall be performed in accordance with Virginia Erosion and Sediment Control Handbook for appropriate installation procedures.
2. Surface Preparation for Stabilization Mat: Any storm drainage channel in which soil stabilization mat is to be installed shall be prepared for installation of the mat according to the mat manufacturer's recommendations. Any areas which are to be covered with a soil stabilization mat shall be protected from erosion prior to the installation of the mat. The protection shall include, but not be limited to, the installation and maintenance of silt fences, straw bale barriers, and temporary diversion dikes.
3. Rip Rap: Excavation of slopes, ditches, or roadways where riprap is to be placed shall be of sufficient depth to achieve finished grades shown on the plans or details. Riprap shall be in accordance with VESCH 3.19.
4. Cut and Fill Slope Preparation: Cut and fill slopes shall be constructed in a manner which will minimize erosion, in accordance with the following:
 - 1) All slopes steeper than 3:1 shall require surface roughening, either stair-step grading, grooving, furrowing, or tracking, if stabilized with vegetation, in accordance with VESCH 3.29.
 - 2) Areas with grades less than 3:1 shall have the soil surfaced lightly roughened and loosened to a depth of 4 inches prior to seeding.
 - 3) Areas which have been graded and will not be stabilized immediately shall be roughened to reduce runoff velocity until seeding takes place.
 - 4) Slopes with a stable rock face do not require roughening or stabilization.

3.2 CONSTRUCTION SEQUENCE

1. General: The CONTRACTOR shall establish a plan for construction sequence so as to minimize the effects of erosion.

3.3 INSTALLATION AND APPLICATION

1. Silt Fence: Silt fences shall be installed in accordance with VESCH 3.05 and the following:
 - 1) Installed height of silt fence shall not exceed 36 inches.
 - 2) Filter fabric splice joints shall occur only at a support post, minimum 6 inch overlap, and securely sealed.
 - 3) Posts shall be spaced a maximum of 10 feet on centers at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without wire support fence, post spacing shall not exceed 6 feet on centers.
 - 4) A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier. Eight inches of fabric shall be

extended into the trench. The trench shall be backfilled and the soil compacted over the filter fabric.

- 5) For extra strength filter fabric installation utilizing closer post spacing, the wire mesh support fence may be eliminated. In such case, the fabric is attached to the upslope side of the posts using heavy-duty wire staples, minimum 1 inch long, or tie wires.
- 6) Filter fabric shall not be stapled to existing trees.
- 7) Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

2. Stone and Riprap:

- 1) Stone on the temporary construction entrance shall be installed to a minimum depth of 1 foot.
 - 2) Riprap shall be installed to the depth of 18 inches or as indicated on the plans, in accordance with VDOT 414. Stone shall be placed such that top of stone be within +/-2 inches of the finished grades shown on the plans or details.
3. Construction Access Routes: Wherever construction vehicle access routes intersect paved public roads, provisions must be made to minimize the transport of sediment (mud) by runoff or vehicle tracking onto the paved surface (VESCH 3.02 and 3.03). Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly as necessary to prevent accumulation of dust, mud and siltation that create pollution or hazardous conditions. At the end of each day the paved surface shall be thoroughly cleaned to remove any/all evidence of dust, mud and siltation. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area. Street washing shall be allowed only after sediment is removed in this manner.
7. Construction Entrance: The construction entrance shall be stabilized in accordance with these specifications. Adequate stone shall be applied prior to and during construction to control dust, erosion, siltation and to maintain normal traffic.
8. Temporary Seeding: Provide temporary seeding in accordance with VESCH 3.31. Provide temporary seeding of any areas when planting time does not permit permanent seeding within 30 days after completion of subgrades and on soil stockpiles.
9. Gravel Outlet Structures: The bases and side slopes of the gravel shall be placed so as to conform to the dike configuration. The invert of the outlet shall be not less than six inches lower than the top of the adjoining earth dike, and the gravel shall extend to the top of the dike. Discharge from the outlet structure shall be onto an already stabilized area or watercourse. The gravel outlet structure shall be inspected for silt accumulation after each runoff-producing rain. If structure ceases to function properly due to silt accumulation, the silt shall be removed and gravel shall be replaced.

3.3 MAINTENANCE

1. Duration: The erosion control measures shall be maintained by the CONTRACTOR until all work covered by this contract is completed and permanent stabilization of disturbed areas has been achieved.

2. Silt Fence:

- 1) Decomposed or ineffective silt fence or filter barriers shall be replaced promptly.
 - 2) Sediment deposits shall be removed when deposits reach approximately one-half the height of the barrier. Sediment shall be removed from the site and disposed at an approved waste area.
 - 3) Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, then prepared and seeded.
3. Construction Entrance Inspection: The CONTRACTOR shall inspect the construction entrance periodically. The stone in the construction entrance shall be replaced when, in the opinion of the CONTRACTOR, OWNER, or ENGINEER, an excessive amount of mud is being carried into the public right-of-way.
4. Disposal: All temporary erosion and sediment control measures shall be disposed of within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed, unless otherwise authorized by the OWNER. Trapped sediment and other disturbed soil areas resulting from disposition of temporary measure shall be permanently stabilized to prevent further erosion and sedimentation.

3.4 FIELD QUALITY CONTROL

1. General: All erosion control facilities shall be inspected by the CONTRACTOR weekly and after each significant rainfall. Inspection shall be performed daily during periods of prolonged precipitation. Any required repairs shall be made immediately.

END OF SECTION

Section 02510 – Water Distribution

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Furnish all labor, materials, tools, transportation, supplies, equipment, testing and disinfection of the water main shown on the plans.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 01610 – Delivery, Storage and Handling
 - 2) Section 02080 – Utility Pipe and Materials
 - 3) Section 02085 – Valves and Cocks

1.2 REFERENCES

1. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.
2. American National Standards Institute (ANSI)/American Water Works Association (AWWA):
 - 1) C651 Standard for Disinfecting Water Mains

1.3 QUALITY ASSURANCE

1. Contractor Responsibilities: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

1.4 DELIVERY, STORAGE AND HANDLING

1. General: Shall be in accordance with Section 01610 – Delivery, Storage and Handling.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Pipe and Fittings, Joints and Coating: All materials shall be in accordance with Section 02080 – Utility Pipe and Materials.
2. Valves: All valves shall be in accordance with Section 02085 – Valves and Cocks.
3. Concrete: Miscellaneous concrete shall be VDOT Type A-3 specifications.
4. Tie Rods: ¾-inch thread steel rods for hydrant clamping shall be galvanized or otherwise rustproof treated. Compatible tie bolts and nut or clamps shall be similarly rustproof treated.
5. Asphalt: For temporary repair of road shall be VDOT BM-25.0.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPE, FITTINGS AND ACCESSORIES

1. Pipe and Fitting Installation: All work shall be in accordance with Section 02080 – Utility Pipe and Materials.
2. Valves Installation: All work shall be in accordance with Section 02085 – Valves and Cocks.

3.2 DISINFECTION

1. Disinfecting Water Mains:
 - 1) Disinfection shall be performed after the pressure testing has passed and approved by the City of Winchester.
 - 2) All water mains shall be disinfected and bacteriological testing completed immediately prior to being placed in operation.
 - 3) The basic disinfection procedure consists of:
 - a. Preventing contamination materials from entering the water main during storage, construction or repair.
 - b. Removing, by flushing or other means, those materials that may have entered the water main.
 - c. Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main. A newly installed main shall be disinfected in accordance with AWWA C651, and the Virginia Department of Health regulations.
 - d. Protecting the existing distribution system from backflow due to hydrostatic pressure test and disinfection procedures.
 - e. Determining the bacteriological quality by laboratory test after disinfection.
 - f. Final connection of the approved new main to the active distribution system.
 - 4) Chlorination shall be by the tablet method, unless otherwise approved in writing by the City of Winchester. This method may be used only if the pipe and appurtenances are kept clean and dry during construction. Alternate disinfection procedures may be required at the option of the City of Winchester if the circumstances are such that the pipe and appurtenances are not kept clean and dry.
 - a. During construction, 5-g calcium hypochlorite tablets shall be placed in each section of pipe. Also, one such tablet shall be placed in each hydrant, hydrant branch and other appurtenances. Table 1 shows the number of tablets required for commonly used sizes of pipe.

Table 1. Number of 5-g calcium hypochlorite tablets required for dose of 25 mg/l

Pipe Diameter (inches)	Length of Pipe Section, ft				
	<= 13	18	20	30	40
	Number of 5-g calcium hypochlorite tablets				
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13

- b. Filling and contact. When installation has been completed, the main shall be filled with water at a rate such that water within the main will flow at a velocity no greater than 1 ft/s. Precautions shall be taken to ensure that air pockets are eliminated. This water shall remain in the pipe for at least 24 hours.
- 5) Final flushing: After the required retention period, the chlorinated water shall be flushed from the main using potable water. However, the chlorinated water shall not be flushed out until the residual is less than 1 mg/L. A reducing agent shall be applied as required to achieve this residual. Disposal of the chlorinated water is the responsibility of the CONTRACTOR and shall be in such a manner as to cause no adverse environmental effects such as fish kills or erosion and in compliance with all federal, state and local requirements. The water shall be discharged to natural stream courses or stormwater systems. CONTRACTOR shall provide all temporary piping and other appurtenances necessary to convey flushing water to discharge points.
- 6) Disinfection at tie-in connections:
 - a. Thoroughly clean all existing pipe and fittings to be installed at tie-in connections and apply a 5 percent hypochlorite solution to all interior surfaces by swabbing or spraying.
 - b. Allow a minimum of 60 minutes contact time.
 - c. Hose down with potable water and immediately install the connection pieces.
2. Bacteriological Tests: After final flushing and before the main is placed in service, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the main. At least one set of samples shall be collected from every 1,000 feet of the new main, plus one set from the end of the line and at least one set from each branch. Samples shall be collected in the presence of an inspector for the Department of Public Utilities in bottles provided by the City. Samples shall be tested for bacteriologic quality by the City of Winchester, and shall show the absence of coliform organisms. If contamination is indicated, then

the disinfection/testing procedure must be repeated. The CONTRACTOR is responsible for the costs of all tests.

3.3 SERVICE CONNECTIONS

1. General: All service taps for connecting service lines shall be made under pressure with proper tapping machine for the pipe being tapped. The water main shall be tested and disinfected before service taps are made.

END OF SECTION

Section 02600 – Drainage Structures

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Furnish all labor, materials, tools, transportation, supplies, equipment, and appurtenances necessary for the complete and satisfactory construction of the pipes, storm drains, drop inlets, ditches, outlet structures as shown on the plans.
2. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
 - 1) Section 02080 – Utility Pipe and Materials
 - 2) Section 02317 – Excavation, Trenching and Backfilling for Utilities
 - 3) Section 03400 – Precast Concrete
3. Materials: All materials and appurtenances required for the work shall be new, of first class quality and shall be furnished, delivered, erected, connected and finished in every detail as specified or indicated. All materials found defective, regardless of the circumstances, shall be replaced with new material at the expense of the CONTRACTOR.
4. Materials Standards: The materials specified for the construction shall comply with the latest revisions of the applicable American Society for Testing Materials (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI) and the Virginia Department of Transportation (VDOT) standards, and the Standard Details herein.

1.2 REFERENCES

1. VDOT Specifications:
 - 1) 212 Joint Materials
 - 2) 232 Pipe and Pipe Arches
 - 3) 302 Drainage Structures

1.3 SUBMITTALS

1. Record Drawings: Upon completion of the work, the CONTRACTOR shall provide three sets of record drawings to the OWNER/ENGINEER clearly illustrating the as-built elevations of all grades, structures and pipes installed as part of the construction.

1.4 QUALITY ASSURANCE

1. Testing Results: Copies of all laboratory and field test reports shall be submitted to the ENGINEER within 48 hours of the completion of the test.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Concrete Pipe: Storm drain pipe and fittings shall be Class III, as a minimum, of a size as called for on the plans, unless specified or indicated otherwise.

Concrete pipe shall conform with ASTM C 76, VDOT Section 232 and VDOT Standard PB-1.

2. Pipe Joints: Reinforced concrete pipe joints shall be made with gaskets or elastomeric or mastic joint sealer for concrete pipe meeting the requirements of VDOT Specification, Section 212 – Joint Materials.
3. Drop Inlets: Drop inlets shall be precast concrete meeting the requirements of VDOT Specification, Section 302 – Drainage Structures and the appropriate Road and Bridge Standard corresponding to items shown on the plans. Inlets specified on the plans can be either precast or cast-in-place. Drop inlets will be shaped according to VDOT Standard IS-1.
4. Manhole: Drainage manholes shall be precast concrete meeting the requirements of VDOT Specifications section 302 – Drainage Structures and the appropriate VDOT Road and Bridge Standards. Manhole inverts shall be shaped according to VDOT Standard IS-1.

PART 3 – EXECUTION

3.1 PROCEDURES

1. Earthwork: All excavation relating to installation of drainage structures shall be performed in accordance with VDOT Specification Section 302.03 – Procedures. All drainage pipe shall be backfilled with VDOT select material #21-A, placed in 6-inch lifts and compacted to 95% of the maximum density.
2. Concrete Pipe: Storm drain pipe shall be installed in accordance with VDOT Specification, Section 302.03(a) – Pipe Culverts.
3. Drop Inlets: Drop inlets shall be installed in accordance with VDOT Specifications, Section 302.03(c) – Drop Inlets, Manholes and End Walls. Drop inlets will be shaped according to VDOT Standard IS-1 and Specifications referenced herein. Where an inlet top is replacing an existing structure, the existing structure shall be removed to the point necessary to install the inlet to finished grade.
4. Invert Shaping: All drainage structures shall have pipe inverts shaped in accordance with VDOT Standard IS-1.
5. Adjust Structure: Inlets and manholes which require adjustment to fit to the finished grade shall have their tops or frame and cover removed, the structure shall be built up or taken down to the final subgrade, and the top or frame and cover shall be replaced. All surrounding materials shall be installed using proper compaction and finishing in accordance with these specifications.

END OF SECTION

Section 03400 – Precast Concrete

PART 1 – GENERAL

1.1 DESCRIPTION

1. Work Included: Furnish and install all precast concrete structures in accordance with the plans and as specified herein.
2. Related Sections: Additional sections of the Documents which are referenced in this Section include:
 - 1) Section 02080 – Utility Pipe and Materials

1.2 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

1.3 SYSTEM DESCRIPTION

1. Manholes: The eccentric design manhole shall be used, except as shown on the plans.
2. Drainage Structures: Drainage structures shall be designed according to the VDOT Road and Bridge Standards.

PART 2 - EXECUTION

2.1 INSTALLATION

1. General: The subgrade and bedding for the precast structure shall be prepared similar to that for pipe. All structures shall be installed level. Shaped bottoms shall be formed with concrete as shown on the plans and shall be smooth conforming to the dimensions shown. Joints shall be sealed with a double ring of butyl rubber rope caulk to form a watertight seal. When leveling of frames is required, manhole frames shall be set level on full bed of mortar to the proper grade prior to the application of the butyl caulk.

END OF SECTION